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JAPAN'S SECRET WEAPON

BY

BARCLAY NEWMAN





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JAPAN'S SECRET WEAPON

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by

BARCLAY MOON NEWMAN

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"Must We Grow Old?"
"Science Rediscovered God"
and other books

Edited by

PETER GREENLEAF

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To
Kathleen Jordan

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I

Oligodynamic Warfare

IN THE death grapple of nations, there is a new jiu-jitsu. With gruesome diligence, the Japanese have thoroughly prepared and have been practicing a new hideous art of warfare with a secret weapon. The facts have been hidden from you. *Why?*

Japanese experts made limited, crafty tests of this monstrous weapon on the Chinese. These preliminary experiments met with success.

Now, on a scale that may turn out to be so vast as to terrify the most rugged imagination, the Japanese have brought their diabolical weapon into action against the armed forces and the civilian populations of the United Nations. The Surgeon General of the United States has warned us. The Chinese have warned us. The Japanese have boasted of their superiority in warfare with this weapon. *Still we are not ready.*

Again, obvious unpreparedness invites attack. Once again, we are foolishly helping the Japanese to manufacture weapons—weapons far more destructive than those which they made out of the steel sold them by Americans.

The time is at hand for a vast sneak attack by the enemy

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—far vaster than that which killed sleeping Americans on December 7, 1941. This attack would strike not only at outposts of empire but even at the life-blood in the very veins of the nation. Its effects would be visited on generations.

A crude type of this secret weapon speeded the fall of Bataan. Two and a half years later, the United States Infantry Journal complains:

“Today it is causing 2½ to 5 times as many casualties in many theaters of war as all [other] types of enemy action combined.”

The incomparable killing power of this Japanese weapon has not been made known to the public. The very existence of such a weapon is not generally known. Ignorance is fuel for panic.

To be sure, on January 12, 1942, Dr. Thomas Parran, Surgeon General of the United States, pointed an accusing finger at the enemy and warned:

“The enemy has planned and in my opinion will use bacterial warfare wherever possible.”

No mention, however, has been made of the stupendous scope of the new disease warfare—not merely bacterial warfare, but even more deadly virus warfare, rickettsia germ warfare, warfare with cancer-causing chemicals.

So mass murder by epidemic is allowed to remain fantastic to Americans. When I called upon the Chinese Ministry of Information for the story of the Japanese use of Black Death against the Chinese civilian population, I was graciously warned by the Chinese, who seemed disconcerted:

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"Americans simply do not believe these accounts. Anything that you can do to help will be sincerely appreciated. When the Chinese Ministry of Foreign Affairs made its official releases, the news was held up for two months because the press associations were incredulous. Then Fletcher Pratt, the military writer, reported some of the facts in the New York Post. Thereupon the New York Times checked with its representative in Chungking. Our accounts were confirmed, and the Times published the full text of the statement. Finally, the press associations sent out the releases over their wires."

The Chinese Ministry of Foreign Affairs had not released these accounts of disease warfare until three months after the Surgeon General made his prediction.

The New York Times is to be commended for its careful checking of the reports of a sneak attack more significant than any previous one in history. The editors of the Times are well aware of the implications. On March 19, 1944, the dean of American interpreters of science, Waldemar Kaempffert, Science Editor of the Times, pointed out:

"Nations today are caught in a net of viruses and bacteria and must survive or perish together."

At technical conferences, many eminent epidemiologists have expressed their dread of pestilences that might be loosed to bring on a continental catastrophe. Natural (non-Japanese) agents of malevolent Nature may at any moment disseminate excessively virulent strains of germs which are still beyond human control. At the National Conference on Planning for War and Postwar Medical Services, held in

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New York City, March 15, 1943, Dr. Thomas Francis, Jr., stated pessimistically:

“The eruption of such a strain would find conditions for dissemination highly satisfactory by virtue of the speed of travel and the massing of groups of individuals presumably more susceptible because of their relative freedom from disease in recent years. The threat of devastating epidemics is an actual one.”

Within a period of six months at the end of World War I, influenza killed 20,000,000 people (550,000 in the United States). In this space of time, its action caused more casualties than did gas, bullets, shells, bombs, mines, and torpedoes throughout four years of modern war.

If there is such a high probability of world epidemics erupting naturally, what is going to happen when disease warfare breaks out on a large scale? We are complacent in the shadow of Japan's massed batteries of secret weapons that have mass-killing power beyond Hitler's wildest intuitions at the beginning of World War II.

The Japanese have ready for action far more destructive weapons than influenza. For instance, they have the ill-understood virus of Japanese encephalitis (“sleeping sickness”), which spreads like influenza beyond human control and is more deadly than infantile paralysis virus. The famous Japanese expert, Hideyo Noguchi, first cultivated the virus of infantile paralysis three decades ago. Against these viruses as mass produced by Tokyo technicians there are neither protective vaccines nor “miracle drugs” so far as American specialists are aware. Research must be speeded.

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The “March of Dimes” must become the “March of Millions.”

If disease warfare is to be waged on an increasing scale, it may be only because the enemy sees that we are not prepared to burn out his nation with more virulent epidemics than he can cause to erupt among us. We must make it clear to the enemy that we are prepared, that we can, with one bomber load of spores over Tokyo, set aflame an epidemic to decimate if not utterly annihilate the whole population of Japan—nay, even make the very islands of his empire desolate and uninhabitable for decades and perhaps a century.

There is only one reason why the enemy has not dared to use poison gas warfare against us. We are obviously better prepared for gas warfare than he is.

It is quite as obvious to the Japanese that we are scarcely beginning to consider the greatest and most hideous of threats to our national existence. We take the whole stupendous problem so lightly that our foolishly benevolent experts on culture and transmission of disease germs and cancer-causing chemicals (which can be broadcast pure or mixed with war gases) are permitted to publish and forward to Japan military secrets whose potentialities for mass murder have never been approximated since man appeared on this planet.

Presumably, these benevolent scientists do not wish to “return to the Dark Ages” by keeping “trade secrets” about disease, as rival medical cliques once were in the habit of doing. Of them you must inquire:

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"Whatever age do you think we are living in now?"

Murder by epidemic and cancer-causing chemicals is new. The germs and chemicals that make such warfare incomparably efficient and inexpensive are just becoming available in scientifically controlled mass manufacture—chiefly because of the internationally recognized diligence of the Japanese along these lines.

Bacteria such as those of bubonic plague were at hand during World War I. But wholesale manufacture and use were unsafe because the users could not have protected themselves with vaccine or sulfa drug. And the ghoulishly ridiculous German general staff, in the old tradition, had so much boyish fun when they put on impressive uniforms, marched men here and there, and heard drums, bugles, and explosions that they scarcely thought of simple ways of killing millions of children and women.

As indicated by the Surgeon General, the enemy has revised the stupendous tragedy of war. The new secret weapon is the most powerful ever conceived by the mind of evil genius. It is most effective in a sneak attack. Indeed, as on Bataan, you can not always be quite sure that the enemy is definitely aiding the evil genius of Nature. Then, as the Philippines fell, 85 out of every 100 of the defending forces suffered from acute malaria. As you can find out for yourself by asking a good malariologist, never in all the annals of epidemiology has there been an approximation to this almost incredible incidence of infection. The malariologist will tell you:

"During World War I, in Macedonia, under conditions

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epidemiologically the same as those in the Philippines during World War II, for months—even against quinine in quantity—malaria immobilized British-French and German troops alike. Such a stalemate was the worst predicament that our medical services in their ignorance of the new disease warfare would logically expect. But on Bataan, a uniquely disastrous epidemic burned out the defending forces while the Japanese, infiltrating the very same terrain, were practically disease free. Of course, quinine shortage made a big difference. But that too was plotted by the careful Japanese. With fore-calculated efficiency and deliberate cunning, the Japanese brought into action the secret weapons of disease warfare. No other conclusion can be drawn from the overwhelming evidence. Did not Parran make his accusation just as the Japanese were gaining swift triumphs because of epidemics?”

The Japanese memorized the lessons taught by Macedonian and Philippine mosquitoes. They remembered that malaria was spread not just in Macedonian swamps on the low-lying coasts but in mountains 6,000 feet above sea level—in the Philippines as well as in Macedonia. Recently a high government official confessed in Washington:

“In the Philippines, our Army medical officers thought to reduce malaria by ordering the troops to camp on high ground. Up there a hill-stream breeder went to work . . . and at once infected our forces.”

In the gloom following the fall of Bataan, the public was somewhat cheered by the official explanation that we were beaten not by the Japanese but by the malaria mosquito

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and the little rods of Killer No. 2, bacillary dysentery, which make shreds of the large intestine, cause high fever, bloody diarrhea, dehydration, sagging flesh, and death as the body turns blue. So we say to the Japanese:

“You are not as important as an insect or even a microbe.”

Back in Tokyo, Professor-Doctor Yoneji Miyagawa, Director of the Government Institute for Infectious Diseases, Tokyo Imperial University, grins. Had he not suggested as early as 1938 that the enemy might make false propaganda out of the obvious Japanese “superiority in bacterial warfare?”

The American public is made complacent by blinding “eye-wash.” Millions of readers, naturally fearful of disease warfare, are soothed by an article in *Reader's Digest*, “Enter Atabrin—Exit Malaria,” by Dr. Paul de Kruif, formerly of the U. S. Public Health Service. Behind the scenes, the conservative New England Journal of Medicine attacks De Kruif and observes that he ought to know better. For atabrin is too toxic for administration over a period of more than three or four days at a time. Atabrin is much less effective than quinine, which is only 50 per cent effective. Atabrin has been known for years and there still are more than 500,000,000 cases of malaria in the world. Atabrin does not cure. At best, it is a suppressive agent, that may or may not keep an infected man on his feet.

In the National Geographic for February, 1944, Senior Entomologist Harry M. Stage, of the Bureau of Entomology, further relieves possible popular fears about “Saboteur Mosquitoes” by stating:

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“The success of the mosquito-control programs conducted by the Army, Navy, and Public Health Service is convincing proof that these insect pests can be conquered.”

Miyagawa grins again. Through Switzerland, Eire, and Argentina, he gets the U. S. Public Health Service Reports, which confesses that malaria has been allowed to spread through American veins until now there are some 1,000,000 malaria patients in continental United States.

Dr. Stage tells how mosquitoes are being blasted by new “aerosol bombs” that “may save more lives than any other single invention of the war.” He further relates the American “conquest” of the most efficient malaria carrier in the world, *Anopheles gambiae*, which was recently “banished” from a small coastal strip of Brazil, at the cost of millions of dollars and the labors of thousands of technicians. This “banishment” was achieved years after *gambiae* first got in from Africa.

Almost simultaneously with Dr. Stage’s optimistic article, the latest Rockefeller Foundation report is published, to announce that *Anopheles gambiae* is again on the loose in the Americas. It has been “accidentally” re-introduced into Brazil, probably without any aid from the Japanese. Still, some mosquito-fighters are hopeful.

In the body of *Anopheles gambiae*, the malaria parasite mysteriously steps up its man-killing power. Malaria becomes startlingly more virulent. During 1938 and 1939, in the small coastal strip cited by Dr. Stage, the *gambiae*-borne malaria parasites killed 14,000 people — a record not yet equalled.

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Dr. Marshall Barber, outstanding malariologist of the Rockefeller Foundation, informs us:

"There is no doubt that this invasion of gambiae threatens the Americans with a catastrophe in comparison with which ordinary pestilence, conflagration, and even war are but small and temporary calamities. Gambiae enters into the very veins of a country and may remain to plague it for centuries."

In 1928-1929, I had the privilege of doing malaria research as scientific assistant to Dr. Barber, then Special Expert, Field Investigations of Malaria, U. S. Public Health Service, in Panama and Costa Rica. Dr. Barber, Dr. W. H. W. Komp, and I made surveys of the incidence of malaria infection among populations of districts outside the Canal Zone, which is the only part of Panama not ravaged by the disease. I found out what malariologists dread — that even without enemy use of malaria as a none-too-secret weapon, modern civilization may be markedly devitalized by parasites out of control. We did research on plasmochin and learned that it has no effect on clinical malaria but in one of the four main types of malaria may have some effect on the mosquito-infecting stage of the parasite. Though too toxic for mass administration, and definitely 100 per cent ineffective in treating malaria, plasmochin has recently (after 15 years) been popularized to the American public as one of the "new miracle drugs" with which American scientists are foiling the Japanese. Plasmochin was first synthesized in Germany, years before we began to experiment with it.

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Dr. Stage's optimism is remarkable indeed. Whereas thousands of technicians were required to rid a tiny coastal strip temporarily of one species of mosquito, this government expert proudly points out that "in the Southwest Pacific, the China-Burma-India theater of operations, the Caribbean and the Mediterranean," the armed forces of the United States can boast a grand total of "more than 250 entomologists." So you see that we have at least a fraction of a technically trained mosquito-fighter to every 1,000,000 square miles of combat area! Why so many? "Because more Americans were put out of action by malaria in Sicily than by the combined forces of Italians and Nazis."

After Dr. Stage wrote of the "success of the mosquito-control program conducted by the Army, Navy, and Public Health Service"—in 1944—two years after "*malaria beat us at Bataan*," you read official complaints from the Pacific: "In some theaters of war in the Pacific, five times as many American troops are put out of action by malaria alone than by all the activities of the enemy."

There are some cheering indications that at least three Washington officials are aware of the significance of Japan's new use of air-power — winged death often five times as effective as combined action of Zeros, bombs, shells, bullets, bayonets, and other non-secret weapons.

On March 15, 1943, Dr. Thomas Parran said:

"The menace of malaria now faces the world as never before in history."

Shortly thereafter, comparatively safe behind a steel editorial desk in the Bureau of Naval Personnel in the Navy

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Arlington Annex across the Potomac, I watched the internecine conflict of giants in Washington. All at once, the national press was ablaze with the charges and counter-charges of Jesse Jones and Henry Wallace. Each said to the other:

“You are to blame for the rubber and quinine shortages.”

Rubber, which can be synthesized, as our great industries have established in the most practical of ways, excluded all but bare mention of the seriousness of the quinine situation. Quinine, which cannot be synthesized, and is all but unobtainable save by courtesy of the Japanese in Java, received scant attention. But the quinine shortage has caused far more casualties than the Japanese sneak attack at Pearl Harbor. For those who are said to have been asleep at Pearl Harbor, a court martial was ordered.

Malaria, although deliberately used by the Japanese, is not their main weapon. Tokyo scientific publications indicate lengthy and careful preparation of a master secret weapon, probably a combined-action weapon, for murder on an almost incredible scale, on a quite inhuman level. Follow the direction of lines of weird scientific research pushed forward in Japan in the pre-war years. You reach a vivid and startling insight into what the Japanese are reserving for large scale use in their final desperation, and perhaps even after apparent defeat and unconditional surrender.

Dreadfully significant sections of the bacteriological-parasitological manual in universal use among the epidemiological experts of your Army, Navy, and Public Health

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Service are testimonials to the Japanese — being but translations and paraphrases of original Japanese reports. The very illustrations for the chapter on the spirochetes of syphilis, yaws (“tropical syphilis”), highly fatal infectious jaundice, and other diseases as common elsewhere as in Japan, are copied from Japanese drawings! They bear credit lines thanking Hideyo Noguchi. What is the deficiency of our syphilology that your services have to turn to the Japanese for information? Strange commentary on our “preparedness”! The manual does not even mention bacterial or disease warfare. This six-year-old manual is the one to which your experts in the field (and at home) must turn for aid against weapons largely developed within the past five years.

But the manual is not too old to bear further testimonials to Japanese culturers and transmitters of ill-understood disease germs. “Groups of Japanese investigators have shown that spirochetes can be cultured, then transmitted by mouth, and through the skin, and by droplet infection through the lungs and eyes”—of guinea pigs and other experimental animals, including human beings, upon which Japanese have a love of experimenting.

Turning from the chapter on spirochetes to more distinctly Japanese writings, as the Japanese Journal of Experimental Medicine and the Journal of the Japanese Cancer Institute, you can see how Professor-Doctor Miyagawa and a great staff have been able to put venereal virus into mass production for transmission in novel and ugly ways. You perceive that here are reports from the world’s vastest

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maze of laboratories for disease warfare. You see that Japanese experts have been studying and even inventing outlandish germs—against which there can be as yet no vaccine or miracle drug—and which may be cultivated on a mass scale, with an increase in killing power, in a medium actually *containing* sulfa drugs. The Japanese have been modifying the little rods causing the various types of epidemic bacillary dysentery. These rods become resistant to sulfa drugs that sometimes kill certain strains. Other recent successes include the cultivation of the rabies virus, which the Japanese can spread by spray and not just by loosing rabid rats and other “mad” animals. In 1940, the Japanese boasted of mass production of leprosy bacilli in the backyard hen. Here you observe the extraordinary stepping up of virulence in one of man's most repulsive diseases—as rarely and vainly hoped by the world's most highly skilled non-Japanese technicians.

Of course American specialists can do as well, and better. But why do they foolishly provide the enemy with military secrets having incalculable killing power? Even as your Surgeon General voiced his warning about secret weapons for mass killing by epidemic, military secrets were on the way from American presses to neutral countries and thence to Japan. These secrets were elucidated in a lengthy report of the technical details of mass producing lethal spores—spores of a newly discovered, cancer-like disease, just now found to be widely disseminated, even without Japanese promotion, among our population, here in the United States. This report states:

“This disease is being recognized in an ever increasing

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number of cases. . . . No race, sex or age is immune. . . . It is inevitably fatal, with no available effective therapy. . . . The majority of cases have not been diagnosed before death. . . .”

All the details of mass manufacture of the fungus spores are given, without benefit of spies, to the enemy, whom we have accused of planning warfare with lesser weapons than this horrible one. Such spores are rugged. They grow in the very midst of antiseptic. They are best transmitted as a fine dust, by the trillions, for inhalation. They stay alive, blown about, indefinitely. No means of prevention and no remedy have been found for any disease similarly caused — by a fungus of the group “Fungi Imperfecti.” Are the Japanese already perfecting their knowledge of this imperfect fungus, perfect for disease warfare? Until sometime after a sneak attack, the symptoms would not begin to appear among the population. . . . One spore of a strain possessing artificially increased virulence might start an epidemic that would sweep across the continent. It is already out of human control, though not dangerously so. What is the outcome to be expected if the enemy uses such weapons as predicted by the Surgeon General of the United States?

As you read this book, the first account of the full scope of disease warfare, you may be shocked into realizing that the stupendous and horrifying possibilities of neo-scientific warfare necessitate a total effort toward disease research and toward ensuring a total, unbreakable peace after victory. With such a weapon, a small or even a defeated nation can overwhelm the mightiest power on earth, and victory may be gained before the enemy is aware the war is on or

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still going on. The last flicker of glamor and all the fun are gone from war. The new weapon is best brought into action by drab scientific technicians, out of uniform. World War II may indeed turn out to be the very last war.

At last, with the new secret weapon, war becomes horrible even beyond all the combined horrors of all previous warring. Postwar policing must be very careful, very thorough and indefinitely prolonged. War has been made too hellish to risk again.

Disease warfare is oligodynamic action. *Oligo* means "little." *Dynamic* speaks for itself. The Japanese have always liked to try to do so much with so little to so many. In oligodynamic warfare, you theoretically can achieve the destruction of a nation by the very lightest of all weapons—by invisibly little spores or grains of fungus, virus, or a still more horrible germ, or droplets of a cancer-causing chemical. If you have perfected one particular secret weapon, you may need only one grain or spore, an infinitesimal monster. The art of disease warfare is an exquisite expression of peculiarly Japanese aptitude and mercilessness. Indeed there is a new and terrible jiu-jitsu for the death grapple of nations.

The New York Daily News has campaigned for large scale use of gas warfare, to shorten the war against the Japanese. Disease warfare would shorten the war to a maximum period of a few months. Of course, we must first prepare the secret plague or plagues, and in the meantime get ready to meet what the Japanese already have prepared for us.

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I hope that the following pages will make clear the fact:

Even before the advent of the long-range plane, the practicability of isolationism was removed—eaten away by international germs, the secret weapon of naturally evil Nature and unnaturally evil Japanese.

II

Warnings and Understatements

ON JANUARY 12, 1942, the Surgeon General of the United States pointed out that germs as weapons can be "as deadly as mustard gas or explosives."

On April 9, 1942, the Chinese Ministry of Foreign Affairs released the following official statement at Chungking:

"National Health Administration Director-General Dr. P. Z. King's report on Japanese attempts at bacterial warfare against China and reports submitted by Chinese and foreign medical experts definitely prove that at least on five occasions Japan has resorted to ruthless bacterial warfare in China."

The Chinese Ministry of Information has provided the full text of the statement made by Dr. P. Z. King and has approved the following summary.

"Up to the present time, the practicability of bacterial warfare has been little known to the public because experimental results, if available, are usually kept a military secret.

"In the past, the artificial dissemination of disease germs has been done for military purposes. The pollution of drinking water supplies by the introduction of diseased animals or other infected materials into the wells has been practiced

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by retreating armies with the intention of causing epidemics of gastrointestinal infections among the troops in pursuit. Fortunately, such water-borne infections can be controlled with relative ease by boiling of all drinking water and disinfection by chemical means.

“Whether or not infectious diseases could be widely and intentionally spread by artificial means with deadly results had not been demonstrated prior to the outbreak of the Sino-Japanese war. In the last two years, however, sufficient evidence has been gathered to show that the Japanese have been using our people as guinea pigs for experimentation on the practicability of bacterial warfare.”

The Chinese government is convinced that the Japanese have tried to produce epidemics of plague in Free China by scattering plague-infected materials from planes. By plague is meant bubonic plague, popularly known as the “Black Death,” which in the past has at one sweep killed tens of millions.

Bubonic plague is transmitted by infected fleas on rats, themselves infected too. The germs are little rods, named *Bacillus pestis*. The microscopic rods are alive and multiply by the thousands within flea, rat, man. Each rod is a laboratory manufacturing deadly chemicals, a mere speck of which is enough to kill the most vigorous man. Within a few hours after gaining entrance through bitten and scratched human skin, each rod has reproduced, to become like the sands in number.

Body temperature soars. The glands in the groin and armpits swell into dark, bulbous “buboes,” swarming with

bacilli. The rods race through the blood stream. They may attack the lungs, to bring on pneumonic plague—invariably fatal. Otherwise, the blood is poisoned, the lymph or tissue fluid is poisoned, and toxin permeates the body entire. Organ after organ fails, and the heart weakens. The brain becomes stuporous. Unless the victim receives the best of medical attention, the chances are that he will die. The least effects are weeks of severe illness. In the lung-affecting pneumonic plague, the patient coughs away his life's blood.

The Chinese Ministry of Information provides the details regarding the Japanese use of bubonic plague:

“On October 29, 1940, bubonic plague for the first time occurred in Ningpo in Chekiang Province. The epidemic lasted 34 days and claimed 99 victims. It was reported that on October 27, 1940, Japanese planes raided Ningpo and scattered a considerable quantity of wheat grains over the port city. Although it was a curious fact to find ‘grains from heaven’ yet no one at the time seemed to appreciate the enemy's intention and no thorough examination of the grains was made. All the plague victims were local residents. The diagnosis of plague was definitely confirmed by laboratory tests.”

The Chinese authorities found no evidence of a suspiciously high mortality in the rat population before plague struck down human beings. Usually, when plague breaks out in the human population, the outbreak is preceded by many deaths among rats—these pests being found dead in cellars, alleys, streets. Further, the Chinese could discover no trace of a human carrier who might have come into

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Ningpo with the disease. And at the time there was no outside source of infection, no epidemic elsewhere, to supply germs "naturally." The authorities concluded that the disease must have been "artificially" introduced.

The Chinese statement continues:

"On October 4, 1940, a Japanese plane visited Chuhsien, Chekiang Province. After circling over the city, it scattered rice and wheat grains mixed with fleas over the western district of the city. There were many witnesses. A man named Hsu collected some grains and dead fleas from the street outside of his own house, and sent them to the local air-raid precautionary corps for transmission to the provincial hygienic laboratory. The laboratory examination indicated that 'there were no pathogenic organisms found by bacteriological culture methods.' Nevertheless, on November 12, thirty-eight days after the visit of the Japanese plane, bubonic plague appeared in the same area where the grains and fleas were found in abundance. The epidemic in Chuhsien lasted 24 days, resulting in 21 deaths."

The fleas collected by Hsu were not adequately examined. No effort was made to inoculate laboratory animals with some of the suspected material. Laboratory facilities were not available.

"Available records shows that bubonic plague never occurred in Chuhsien before. After careful investigation it was believed that the strange visit of the enemy plane was the source of infection and that the transmitting agent was rat fleas, presumably infected with plague and definitely dropped by the enemy plane. As plague is primarily a

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disease of rodents, the grains were probably used to attract rats and expose them to the infected fleas mixed in with the grain.

"On November 28, 1940, when the plague epidemic in Ningpo and Chuhsien was still in progress, three Japanese planes came to Kinwa, an important commercial city situated between Ningpo and Chuhsien, and there dropped a large quantity of small granules about the size of shrimp eggs. These strange objects were collected and examined in a local hospital."

The granules were rounded, about $1/25$ th of an inch in diameter, whitish-yellow, somewhat translucent, and having a glistening surface. Brought into contact with a drop of water on a glass slide, a granule would begin to swell to about twice its original size. Shaken in a test tube with a small quantity of water, granules would break up into whitish flakes and afterwards would produce a milky suspension. Presumably, germs could thus be spread through water supplies into which the granules might fall or into which they would be washed by rain.

Microscopic examination of these granules revealed the presence of numerous bacilli—rod-shaped bacteria—indistinguishable from the germs of bubonic plague, *Bacillus pestis*. Again the inadequacy of laboratory facilities forestalled any animal inoculation tests which would have established the precise nature of the tiny rods. A guinea pig inoculated with *Bacillus pestis* develops plague, as the rods multiply in flesh and blood.

The startling discovery of such bacteria in the granules

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was reported to the National Health Administration, and Dr. W. W. Kung, Director of the Department of Epidemic Prevention, was sent to Kinwa, with Dr. H. M. Jettmar, epidemiologist, formerly of the League of Nation's Epidemic Commission, and other technical experts. The investigators arrived in Kinwa early in January, 1941. They examined 26 granules and confirmed the previous observations. Dr. Jettmar performed inoculation tests on guinea pigs. Results were negative—no guinea pig showed symptoms of plague. According to the Chinese report:

“It is difficult to say whether or not the lapse of time and method of preservation of the granules had something to do with the negative results from the animal inoculation test, which is a crucial test for *Bacillus pestis*. At all events, no plague occurred in Kinwa and it is indicated that this particular Japanese experiment ended in failure.”

Bacteriologists have been interested in several dark problems concerning these mysterious, bacteria-containing granules. Did the Japanese expect the germs to stay alive indefinitely? If so, then the Japanese must have gone far with their research on plague as a weapon. Unless experiments in Japan had met with some success, there would be no reason to hope to preserve alive such bacteria in the granules. Do plague germs stay alive and virulent for days only in such granules, whatever their composition? It must be remembered that about six weeks had elapsed between the fall of the “grains from heaven” and their examination by the experts. If other nations know how to keep plague germs alive in granules, the method has not been published

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and must be considered a military secret. Still another question must go unanswered: Could these bacilli have been a modified type of plague germ? Modified by repeated growth in the bodies of rats, guinea pigs, or even men, so that the virulence was stepped up? Virulence depends upon the host or culture medium, as has long been known to bacteriologists. Edward Jenner showed that smallpox virus from a man would have its virulence decreased by growth in the body of a heifer, and become cowpox virus, safe for vaccination. Conversely, the virulence of rabies virus can be stepped up by repeated passage through living animal brains. As you will see, Japanese scientists have been making experiments along these lines—upon which you are entitled to look with all the suspicion you can focus. Some of these lines of research are highly suggestive of evil afoot rather than of forward stepping medical research.

Whatever the answer to the question of the nature of the germs, you can be sure that if a Japanese plane burns up scarce aviation gasoline in order to scatter granules containing bacteria, a story of secret research must be somewhere in the background.

Flying very low through the thick mists of five A.M., November 4, 1941, a lone Japanese plane hovered over Changteh, in Hunan Province. It loosed strange gifts upon the Chinese below—wheat and rice grains, cotton wadding, pieces of paper, and some unidentified particles—instead of mere bombs. After the all-clear signal had been sounded, some of the enemy's gifts were collected by the police and sent to a local missionary hospital for examination. Labora-

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tory technicians at the hospital reported the presence of "microorganisms resembling *Bacillus pestis*." This was one month before that other fantastic event—Pearl Harbor.

The incubation period is the time elapsing between the moment of infection and the appearance of frank symptoms of a disease. In the instance of bubonic plague, the usual incubation period is some three to seven, eight, or even fourteen days.

On November 11, that is, seven days later, the first clinical case of plague came to notice. Five more cases showed up by January 13, 1942. Diagnosis in one case was confirmed definitely, by culture of the germs of *Bacillus pestis* in bacteriological jelly and by inoculation of the germs into guinea pigs, which came down with the disease.

The Chinese bacteriologist, Dr. W. W. Chen, who had had special training in plague work in India, and Dr. R. Pollitzer, epidemiologist of the National Health Administration and formerly of the League of Nation's Epidemic Commission, investigated. They concluded that the outbreak at Changteh was caused by enemy action, and presented the evidence as follows:

Never before had plague struck Changteh. With severe epidemics merging into pandemics elsewhere in China, this part of Hunan—in fact, this entire area of Central China—had remained free of the scourge of Black Death.

Had this outbreak been caused by germs spreading from plague-infected districts at some distance? Plague spreads along transport routes for grain on which the rats feed. The nearest epidemic center to Changteh is Chuhsien in Che-

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kiang, about 2,000 kilometers (1,200 miles) away by land or river communication. Furthermore, Changteh is a rice producing district. It supplies rice to other districts. It does not receive rice—and rats—from other cities. And all the cases occurring in Changteh were native inhabitants. None had been away from the city or its immediate environs.

All the cases of Black Death developed in the city areas where the enemy gifts were found. So, presumably, the cotton rags had hid fleas. The wheat and rice grains attracted rats, and the fleas with their plague germs sprang into the hair of the rats.

Fleas were not found. But no one had looked for fleas. The air raid alarm had lasted some 12 hours—plenty of time for the fleas to get away from the cotton, and to spring on rats—or men.

There had been no remarkable increase in rat mortality either just before or for some time after the “aerial incident.” As a rule, a high rat-mortality precedes an epidemic. The infected fleas must first have attacked men and, later, rats. About 200 rats were caught and examined during the months of November and December. No evidence of plague was found. Toward the end of January, a batch of 78 rats included 18 with definite symptoms of plague.

All of the first six human cases showed up within fifteen days after the “aerial incident.” All must have been infected at about the same time, presumably by the same batch of infected fleas, which are able to survive for weeks without feeding.

In early 1942, a serious epidemic of plague spread through

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the provinces of Suiyan, Ningsia, and Shensi. But no clear evidence linking this outbreak with Japanese action has been forthcoming. Did the enemy succeed in achieving a perfect crime? Nobody knows. Of course it is possible. The Chinese authorities have information which they have not yet released but which has led them to mention confidential "reports that probably the plague was caused there by enemy action."

In November 1942, the periodical *China at War*, published by the China Information Committee, Chungking, China, cited another incident in Japan's bacterial warfare:

"According to a recent report of the Aeronautical Commission of the Chinese Government, three Japanese planes dropped a large quantity of 'kaoling' and corn grains in Nanyang, in Honan Province, on the morning of August 30, 1940. The grains were analyzed by local medical officers and found to contain bubonic plague bacteria. This is the sixth known attempt made by the enemy at bacterial warfare against the Chinese by dropping infected grains and other materials."

Dr. P. Z. King, Director-General of the National Health Administration, states:

"The facts thus far collected leads to the conclusion that the Japanese army has attempted bacterial warfare in China. In Chekiang and Hunan they definitely scattered infected materials from the air and succeeded in causing epidemic outbreaks of plague. Aside from temporary terrorization of the general population in the afflicted areas, this inhuman act of our enemy is most condemnable when one realizes

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that once the disease has taken root in the local rat population, it will continue to infect men for many years to come. Fortunately, the mode of infection and the method of control of plague are known, and it is possible to keep the disease in check by vigorous control measures. Our difficulty at present is the shortage of the anti-epidemic supplies required. The recent advance in chemotherapy has given us new drugs that are more or less effective in the treatment of plague cases. These are sulfathiazole and allied sulfonamide compounds.

“For prevention, plague vaccine can be produced in considerable quantities by the Central Epidemic Prevention Bureau. . . . Rat-proofing of all buildings and eradication of rats are fundamental control measures. But, under war conditions, they cannot be satisfactorily carried out.”

Thus you see that the Japanese have made tests of bacterial warfare on the Chinese as guinea pigs. The enemy has not hesitated to use a disease that will continue to kill children, women, and men for years after the attack. Will they hesitate to bring to bear another weapon, obviously terrible disease-causing chemicals, whose effects may rage through decades, to destroy its human thousands by creeping death—for which there is neither prevention nor satisfactory cure?

Remember: Popular interest seems to have fastened on bubonic plague as the probable weapon in disease warfare, but why should the Japanese play up to popular interest and do the expected? There is much evidence to support the view that Japan will bring to bear secret weapons even

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more gruesome than Black Death.

Possibly you are one of those who consider it too fantastic to be credible that the Japanese have even thought of bacterial warfare. Perhaps you have heard that only Black Death would be a practicable bacterial weapon. To reach new conclusions, you have only to read what Japanese scientists themselves have to say. They themselves have hinted—amidst obvious boasts on other matters—of the use of a much less dreadful weapon than bubonic plague and with much greater success—if actually so used.

A neglected though readily available document, printed and published in Tokyo on December 20, 1938 (three years, minus a fortnight, before Pearl Harbor), shows how one Japanese mind toyed with the thought of bacterial warfare—and hints at far more. This strange document reports on the “Activities of the Japanese Medical Corps in China.” The photostatic reproduction on the opposite page tells you that this boastful report to Japanese scientists—and, in English translation to the scientists of the world, was made by “Prof. Dr.” Yoneji Miyagawa, Director of the Government Institute for Infectious Diseases of the Tokyo Imperial University. This bacteriologist is also executive head, under the honorary chairmanship of Baron Gonsuka Hayoshi, of the entire “Dojin Medical Society”—not only, as you see, directly subsidized by the Japanese Foreign Office for “*the spread of culture*” but actually organized as the Japanese Medical Corps for North China and Manchuria.

“The name ‘Dojin’ is said to be based,” explains the Prof. Dr., “on the old Chinese saying: ‘The sage will regard every

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ACTIVITIES OF THE JAPANESE MEDICAL CORPS IN CHINA.

BY

DR. YONEJI MIYAGAWA.

(Received for publication December 6, 1938)

The Dojin Medical Society is the only active medical corps engaged at present in therapeutics and prevention of diseases within the Japanese occupied territory in China. The devoted services of the society ever since last October have been most remarkable with more than one million patients treated. In the field of preventive activities against epidemics, remarkable results were also achieved, much appreciated by the public.

First of all, we should like to give you some basic information about the Dojin Medical Society itself. The society was founded about 38 years ago at the time of Russo-Japanese War when the Japanese authorities took a determined initiative for the medical cooperation among all Eastern-Asia countries for the sake of common welfare. A medical society was thus created under the name of Dobun medical society, which was later changed to Asiatic Medical Society, and again the name was changed to the present one — Dojin Medical Society. The name Dojin is said to be based on the old Chinese saying "The sage will regard every human being with the same benevolence". The name indicates therefore the society's aspiration for the common brotherhood in the Orient.

The first Director was to have been the late Prince *Atsumaro Konoye*, father of the present Premier, as he was largely responsible for the birth of this new medical society. But the prince declined the offer as he was busy with another cultural body, "Dobun Society" and he recommended Viscount *Nagaoka* for the position. Viscount *Nagaoka* after serving for some time as Director of the society, gave up the position to the late Marquis *Shigenobu Okuma*, who devoted himself faithfully to the society's cause for over a dozen years. It was under the leadership of the marquis that the society achieved a great stride forward. Marquis *Okuma* was succeeded by Count *Kosai Uchida*, and today the society is under Baron *Gonsuke Hayashi*.

The chair of Vice-chairman has been occupied by a series of influential names in the field of medicine and finance, including *Kuniyoshi*

Katayama, Baron Susumu Sato, Baron Tanemichi Aoyama, Messrs. Keizo Tanba, Tatsukichi Irisawa, Teiji Eguchi, and at present Kenji Kodama and I.

At the time of its foundation, the Dojin Medical Society used to operate hospitals in Seoul (Keijo), Taikyu, and Keijo in Korea, and Antung and Yinkiu in Manchukuo. A number of notables were exchanged between Japan and China for the cause of cultural cooperation. With the annexation of Korea to Japan, hospitals in Korea were transferred to the South Manchurian Railway Company. About this time, the Dojin Medical Institute was established in Peking and soon later in Hankow. This was over 20 years ago. Hospitals were further established in Tsingtao and Tsinan. Just prior to the current Sino Incident, the Dojin Medical Society had hospitals in Peking, Tsinan, Tsingtao and Hankow. Although many difficulties came to be felt by the society for the past decade on account of the anti-Japanese prevalent in China, it did enjoy a great influence as well as prosperity at the beginning of its foundation. For 15 years from 1914 to 1929, the society had the honor of having His Imperial Highness Prince *Kunihiko Kuni* for its president. At the time of its foundation 27 branches were placed all over Japan, with one even in Formosa, and the society's membership was huge. Not only in medical and sanitary fields, but in all other activities, the society achieved great results. And the membership of Dojinkai meant an honor. This state of affairs however was put to an end unfortunately by the violent anti-Japanese policy pursued by the *Chiang Kaishek* regime. And those engaged in actual medical work in China experienced many unpleasant things.

The present Sino-Incident did afford us many opportunities to do active medical service not only in the above mentioned 4 places but all over North China and Middle China.

As soon as the present incident occurred, a great persecution movement arose in Hankow, Tsinan, and Tsingtao, and it became impossible for the Dojinkai hospitals there to continue functioning and the medical staff there were naturally forced to leave for home.

However, fortunately in Peking, the war scene was not extended to the city, and although compelled to flee to diplomatic quarters for about 2 weeks, the Dojin hospitals were able to continue their medical treatment and therapeutical works. How important the Dojin medical institutes have become in Peking can be seen by the tremendous crowds of patients only to be put in order by police forces presenting a wide contrast from its former prosperity. The medical corps in the Tsinan, Tsingtao and Hankow hospitals all went back to Japan for the time being to watch the situation.

In North China, various diseases occurred among the residents exposed to the warfare. And the medical and sanitary organizations to take care of them were destroyed by war and the situation became such that it might be even made use of for anti-Japanese propaganda. A proposal was made hereupon that a medical corps be organized by the old staff of the hospitals to engage in the relief work of the afflicted. The idea was put to force with the understanding of the Japanese military authorities. It was October last year, that the medical center was opened for the first time in Peking, and shortly later in Tientsin, Tsang-hsien, Paoting, Shihkiachwang and Chengting. A medical corps was sent to Taiyuang immediately after its fall into Japanese hands and to Tsinan, and Tsingtao, also after their fall. Likewise the successive fall of Shanghai, Nanking, and Haichow created a demand for medical corps in these areas. And this time with the permission of the Foreign Office an entirely new medical corps was organized and branches were also open in Hsuechow and Chinkiang. In Hankow, simultaneously with its fall, the Medical of the Dojin Medical Society had to take care of the medical side of the welfare. Thus the Dojin Medical Society has taken upon itself the whole medical enterprise in North China and Middle China.

Incidentally the Dojin Medical Society is a juridical person and is a subsidized society of the cultural section of the Foreign Office. That is to say it is subsidized with a considerable sum of money from the Foreign Office to execute a part of its cultural program in China.

Apart from the medical center in Peking, considerably large medical institutes have been established in Shihkiachwang, Taiyuang, Tsinan, Tsingtao, Hsuechow, Shanghai, Nanking, Hankow and Haichow on the request of the military authorities.

The thorough medical treatment given by first class doctors financed by the Japanese government is naturally a great gospel in the area where the merest medical treatment has become an impossibility due to the war situation. The cases to be treated by one medical corps at one place are at least several hundred, sometimes amounting to one thousand. Up to today, over one million cases were treated. Foreigners cannot help but laud such devoted action on the part of the Japanese medical corps, and some foreign reporters sent their dispatches with profuse words of appreciation.

Next a word about the medical preventive corps. Two separate corps are sent to North and Middle China respectively from Japan. As you know all sorts of epidemics occur in war zones. The best known example being *Napoleon* who suffered from exanthematic typhus.

The idea of sending medical corps against infectious diseases was first conceived by the Foreign Office and with the understanding of the medical authorities, the plan came to be materialized in last March and April. Cholera had already appeared in China by this time. In Shanghai, cholera was in rage about June, and this was followed by Tientsin, spreading gradually to North and Middle China as a whole. We felt it was high time for Japanese medical corps to show its ability. I myself, unable to resist the call left for China in the midsummer, August.

Prevention epidemics is a complicated affair. An ordinary medical treatment of disease merely requires to stay in one place and examine a patient with stethoscope and give him medicine. But things are not as simple for the prevention of diseases. As the same questions are always asked of us regarding the procedure of the preventive corps, we might give here a brief explanation of it.

For the perfect execution of epidemic prevention, we have to have first a perfect research institution which must be equipped with a hospital. Next we have to have a moving medical corps to take care of local cases.

In the present conflict cholera broke out in the International Concession, the part which is not under the control of the Japanese forces. Now the International Concession belongs to the Chinese Municipality, and there are five staff doctors headed by *Jordan*, among them being Dr. *Vio*, who is an Italian doctor and an exchange fellow student. He was studying under me for the past one year and I had a chance to get information through him. This Italian doctor told me that 100 to 150 cholera cases occurred daily in the International Concession, producing 20,000 patients in all. But there are little or no cases reported in the zones guarded by Japanese forces. Only 90 cases were reported throughout the summer and an amazing thing is that none of them had died. The Chinese municipal authorities are said to be commenting that Japanese are strong fighters against bacteria as well as in actual warfare. The violent cholera cases which occurred in Kiuyang right after the warfare were put to an end in two weeks thanks to the activities of the Japanese medical corps. The hardship one has to go through in these medical cares is unimaginable for those staying at home. This summer was literally spent in fighting bacteria. As reported in some newspapers, bacterial war was actually carried out in the present Sino conflict.

The number of the Dojin Medical Society staff at present is about 600, and the medical corps to be dispatched are composed of university doctors. As for epidemic preventive corps, the staff includes medical bodies from all over the country, including Hokkaido, Formosa and Korea.

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human with the same benevolence.' "

Long before Pearl Harbor, Japanese leaders in their super-confidence boasted of dictating peace in the White House. Note how Leader Miyagawa brags. The Chinese are beginning to say that the Japanese are as great in bacteriology as in other warfare. The healthfulness of Japanese-held territory is in impressive contrast with the thousands of cholera cases within the enemy lines. So remarkable is this contrast that Miyagawa suspects that the enemy may use it as propaganda—claiming the use of bacterial warfare by the Japanese.

The great Prof. Dr. during the past year had a student, Dr. Vio, an Italian, studying under the famous bacteriologist of Greater Asia. When Miyagawa goes to Peking, this former student is in the International Concession, to which the Prof Dr. has no access because he is an enemy agent. So Vio plays the spy, and sees fit to be Miyagawa's informant (if not a more fearful agent), as related by the Japanese braggart:

"In the present conflict, cholera broke out in the International Concession, the part which is not under the control of the Japanese forces. Now the International Concession belongs to the Chinese municipality and there are 5 staff doctors headed by Jordan, among them being Dr. Vio, who is an Italian doctor and an exchange fellow student. He was studying under me for the past one year and I had a chance to get information through him. This Italian doctor told me that 100-150 cases occurred daily in the International Concession, producing 20,000 patients in all. But

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there are little or no cases reported in the zones guarded by Japanese forces. Only 90 cases were reported throughout the summer. . . . As reported in some newspapers, bacterial war was actually carried out in the present Sino conflict."

In wartime, with prejudice and hate aflame, perhaps it is not possible to interpret this document by the cool logic of science. So you must place your own interpretation on what the Japanese scientist says. But before you reach a conclusion, you ought to be able to pay some attention to certain obvious facts.

The final statement of the great Prof. Dr. is definitely interesting. Is the boast figurative? Why does he undiplomatically bring up the ugly subject of bacterial warfare? If the enemy can use the statistics as propaganda, why suggest the trick? Does he have a guilty conscience, and realize that he must be beforehand with his reply?

The English translation was printed in the Japanese Journal of Experimental Medicine, for all the world to read. Yet the Japanese makes no bones about Vio being his spy. On this information, Chiang Kaishek could hold Vio for trial. Did Vio carry more than facts valuable to the enemy?

Is the Prof. Dr. announcing subtly to expectant Japanese scientists that bacterial warfare, in the horrible sense, was actually carried out? Before Pearl Harbor, other Japanese leaders were less reticent, as about dictating the peace in the White House. There is the possibility that Miyagawa was somewhat subtle because he was dealing with a vital military secret.

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There is the possibility too, that Miyagawa was sure: No one would believe "bacterial war" really meant bacterial war. And so he could laugh up his sleeve at the fatuous enemy.

The foresight of the Japanese Foreign Office is astounding in one way, and its inefficiency equally astounding, in another way. Long before the epidemics start, a prominent bacteriologist is made the head of the Japanese Medical Corps for all North China and Manchuria! But is it not inefficiency to appoint a research bacteriologist to such a high military position—especially in view of the fact that, in a military nation, there are many practical bacteriologists? Indeed, why appoint a bacteriologist, even a practical bacteriologist and a military leader, to the post of executive director of an entire Medical Corps? The problems of a medical corps for a region as great as North China and Manchuria would of course include control of epidemics. But they would include vastly greater problems of practical administration—military administration—and the care of the wounded, which should be the prime consideration. In such problems, a theoretical research bacteriologist would be lost, unless he were sent armed with secret weapons to create vaster problems. Out of the research laboratory would come the new secret weapons of disease warfare—to be tested in the field, with the director of the research naturally guiding the tests.

Strange, too, it is that even after Vio had studied under the renowned Prof. Dr. for a year, the Italian doctor could not prevent bacterial war as did his master. The whole

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report is weird.

Phenomena still more weird has emerged from the laboratories of experimenting Japanese. And you can read in the reports from these gloomy laboratories shadowy indications of the future—and of a secret weapon which may make the plane obsolete as a weapon of war.

III

Miyagawa Spreads Culture—of a Virus

IN A DEATH grapple, in warfare of total annihilation, no weapons are barred. So Japan has decided. You know that Japan has acted in accord with this inhuman decision—possibly no more distinctly inhuman than war itself.

To fight such an opponent intelligently, you have to consider all possibilities. You must calculate the probability of extensive application — not mere tests — of each and every potentially effective weapon available to or invented by the enemy. It is your life, your nation, or his—

What of Miyagawa himself? When Japan was preparing for a total war, a war to destroy you and the United States, what was he doing? A research bacteriologist like Pasteur, Miyagawa may have been moving toward unsought fame by devising better methods of protecting little children against attacks of lethal germs.

Turn back the pages of the annals of medicine. Turn back to the story of the early thirties—when Hitler, Mussolini, and Tojo were testing the wings of new inventions for mass murder. The director of the Government Institute for Infectious Diseases of Tokyo Imperial University was obeying the will of his emperor, was familiarizing himself with

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his new administrative duties, and was keeping up with the major advances in bacteriology. Miyagawa studied the reports of the researchers in the United States, England, France, and Russia.

Miyagawa become more and more fascinated. Taking rise before him was a whole new science of life and death—death on a tremendous scale. Thousands of investigators were reporting many astonishing discoveries about death's most dreadful living agent—virus.

Virus! What a deadly weapon! Within a period of six months just at the end of World War I, influenza virus had killed 20,000,000 men, women, and children. This total included 548,000 in the United States. The Germans had taken three times as long to kill less than half as many Americans. Scores of millions of human beings had been violently attacked and incapacitated. Within a half year, an invisible agent had caused casualties whose total was many times that boasted by all the armed millions of the Central Powers after four years of modern warfare.

Some of the dimes you gave to the "March of Dimes" went into investigation of viruses — particularly that one causing infantile paralysis.

Today you can go to any one of many American laboratories to see what a virus looks like. The scientist holds up a test tube containing a mass of virus. You see a crystal, like a diamond. This jewel, seeming no more alive than any other precious stone, is merely dormant. For only in living flesh can it show its horrible life.

The jewel you see has been crystallized out of an extract

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made from living tissue. Like a crystal of pure salt, the pattern for disease and death is made up of many particles, lined up in neat geometric symmetry. Each of the particles present in either jewel is too tiny to be seen even under the most powerful system of lenses. Each particle is a molecule, the smallest possible particle of the material, whether salt or virus.

Many thousands of salt molecules must get together to form a salt crystal. A visible, diamond-like virus crystal is built up out of many thousands of individual virus molecules—each particle by itself a germ of death.

The lone virus particle or germ is beyond the powers of the best microscope. In contrast, a rodlike bacillus of bubonic plague can easily be brought to view by aid of the microscope. The tiny rod is constructed of many different kinds of molecules—water, salt, sugar, oil, protein. Break the rod apart and you kill it and its power to cause disease. None of the component particles of the rod can by itself multiply in human flesh. The virus molecule, however, as small as it is, is self-reproducing. Hence the scientist calls it a super-molecule. It is the simplest form of life, and is the only molecule definitely known to be alive. The virus is a monster molecule from that dim zone between the inanimate and the animate—the non-living and the living.

Crush the virus “diamond” into a hundred million particles. Stir these particles into ten gallons of water. Stir thoroughly, so that the fragments of the crystal are evenly distributed throughout the liquid, and every drop of water holds one or more of the dormant bits. Now you have con-

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taminated water—whose millions of drops could be used to infect millions of men. Let a guinea pig—human or animal—drink a drop of this contaminated water. Into the flesh goes the virus particle, and the invisible monster feeds on the warm, nutrient bed in which it lies. In this happy medium the germ swiftly multiplies and gives rise to countless hordes. The body of the host soon has teeming millions of virus particles. By suitable apparatus and technics, you could extract from some virus-caused sore—as from a smallpox pustule on the skin—enough virus monsters to shape once again a visible jewel of death. From one monster you have grown a mass in whose beautiful symmetry lurk enough molecules to infect a nation. What a treasure is this jewel—of influenza, infantile paralysis, smallpox, or of Japanese encephalitis (“sleeping sickness”)!

Some viruses are now obtainable in the pure, crystalline form. Others are obtainable in quantity, though not pure enough to form diamond-like crystals. Such impure virus is mixed with harmless material from the host's flesh but each of the myriads of virus monsters is infective. What do such impure masses of virus look like? Some are translucent, rounded granules—much like the “grains from heaven” sown among the Chinese guinea pigs. Were these “heavenly grains” actually masses of partially purified—though still highly virulent—virus germs? In which plague bacilli were imbedded, as a trick to mislead enemy detective-bacteriologists? The Chinese experts have been silent. Outbreaks of disease which reduce manpower are military secrets. Miyagawa knows too much already.

Miyagawa Spreads Culture—of a Virus

Miyagawa, ten years ago, read how virulence can be stepped down or stepped up. Medical researchers know that the kind of host, and other chemical or physical factors affect the death-dealing power of a given virus. Jenner in 1796 worked well though utterly ignorant of the nature of virus. He got virus germs from pustules on heifers and imbedded them in the flesh of a boy, and so made him immune to smallpox. Life and reproduction in the flesh of the heifer cause a slight change in the architecture or pattern of the smallpox virus, which is transmuted into relatively weak cowpox virus pattern, safe to use for vaccination. Pasteur found out how to weaken virus by dehydrating rabbit brain in which rabies (“hydrophobia”) virus was multiplying. He caused a shift in the original pattern. The new pattern is what your doctor injects to stimulate the manufacture of virus-resisting chemicals by a human body into which a “mad” dog has introduced the old, highly virulent design for “death-in-madness.”

Miyagawa noted with more interest: You can change the pattern for death so that, instead of reducing power to kill, you step it up. He had translations of reports on how you can grow infantile paralysis virus in monkey brains and thereby steadily step up the killing power of the virus. You can use such accelerated death to kill a monkey or a man within a shorter time than the old pattern requires for its lethal activities.

Miyagawa became so interested in the possibilities of the new science that he relegated to second place an earlier series of researches—his hope for fame. In the twenties he

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had dug up an old hypothesis, which indeed may one day turn out to be profitable speculation, though it too has its death-dealing potentialities. This speculation was: If you take any organ out of the body of an animal, say the heart of a guinea pig, and grind up the organ, and shake the ground-up material with salt water, you get an extract containing juices that have some effect on this particular organ—the heart—of a second animal. To get this effect, you have to filter the extract, then inject some of the clear juice beneath the skin of the animal. According to the quantity injected (said Miyagawa in trying to explain away contradictory results of such experimenting), the heart may beat faster or slower, may increase in size or decrease in size. (With such a broad conception, he couldn't go wrong. Anything you inject—even distilled water—has *some* effect on the heart and every other organ.) Miyagawa kept some of his students busy at odd moments—right up to 1941—on this private bid for fame. These haphazard experiments, as you can see by reading translations of the reports, lead apparently nowhere, unless into the realm of cancer-causing chemicals, with essential facts kept secret and out of the published scientific papers. But these reports from his underlings are all dutifully inscribed:

“Under the direction of Prof. Dr. Y. Miyagawa . . .

“Under Prof. Miyagawa's direction, I carried out the following research works . . .

“Prof. Miyagawa found the so-called direct action of tissue extracts which is revealed by injecting a certain amount of organ constituents . . .”

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But these reports became shorter and fewer as Pearl Harbor Day approached. Miyagawa's laboratories became preoccupied with methods of transmission of infectious diseases—including leprosy, kala-azar ("Black Fever"—not "Black Death"), and, above all, virus diseases, especially a venereal disease little known in the United States. This virus infection is not the less dreadful because it is named lymphogranuloma inguinale (or venereum). Other virus diseases also fascinated Miyagawa—for instance, a disease utterly unknown in the United States and every other country except Japan: Japanese encephalitis, a "sleeping sickness" caused by a virus whose lesser effect is a variety of influenza. Nothing significant was reported on Black Death. On malaria, World Problem No. 1 among all epidemic diseases in war and postwar years, there was one report.

The virus of lymphogranuloma inguinale inspired more experimenting than any other germ. One report bears eight other names besides that of Miyagawa—a number of authors astounding to American scientists. Much more space in Japanese medical literature was given to venereal virus than to any other infectious disease—readily transmissible germ disease. Only one other disease-causing chemical got more attention—cancer-causing chemical. But cancer in man is not an infectious disease, nor is it a germ disease, according to the leading experts. Chemicals causing cancer are not living, like virus molecules. (A variety of rabbit cancer—papilloma—is definitely caused by a virus. One day some variety of human cancer may turn out to be caused by virus.) Only indirectly and then as a researcher in the field

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of disease-warfare would a director of a Government Institute for *Infectious* Diseases be engaged in experiments on a non-infectious disease, such as cancer. An apparent exception would be experimentation with virus-caused cancer in animals—at present an impractical problem for one whose duties lie in the field of human infection.

Venereal virus, at any rate, attracted the main attention of Miyagawa and his colleagues after 1935 and up until 1941. Except for a few pages on how to transmit diphtheria germs efficiently, how to transmit syphilis, how to transmit leprosy, how to transmit tuberculosis, since 1935 several entire issues of the Japanese Journal of Experimental Medicine have been given over to reports on venereal virus.

If you are going to forge a new weapon, are you going to tell the world about the secret?

In the beginning, in the early thirties Japanese scientists undoubtedly had a natural interest in virus. When a new science is first started, research in that science is intensive and extensive the world over. In a new science, discoveries come easily—because there is a gem of new knowledge at every step. The big discoveries are made by the skilled prospectors who hurry.

When basic facts are being unearthed in a new science, the chances of gaining immortal fame are good. National pride is another factor. Miyagawa and his colleagues could not allow themselves to lag behind other hunters after the secrets of life and death. And, of course, virus diseases are immensely important because they are among the outstanding killers of mankind. Naturally, Japanese scientists studied

them.

Why publish reports of progress? Why don't seekers of fame keep their experiments secret until the big discovery is made? Natural phenomena are so complex and tricky that few big discoveries have ever been made without the aid of many thousands of researchers in many lands. Tens of thousands of scientists have cooperated in investigations of infantile paralysis and have discovered no prevention and no cure. False "cures" for cancer have been announced again and again, most notoriously by the lone wolves—who hid their progress and their mistakes—mistakes which "competitors" would quickly have pointed out, to save further wasted effort. Even the most brilliant experts in the most elaborately equipped laboratories have often made astounding errors. Experimenters are often wishful thinkers. They tend to read conclusions in inconclusive results. For rapid progress toward discovery, an investigator must have his results checked, confirmed, or contradicted by disinterested observers and, best of all, by rivals.

A scientist headed for success accelerates his advance by reporting at least some of his findings. He gains hints from the world's evaluation of his reports, which are checked free of charge by the best brains and best laboratories. He thus may draw just the right suggestion for eventual big success. After all, he can keep his main secret to himself. As Dr. Alexis Carrel once asked: "Who can foresee the end of a research?"

An apparently benevolent research can win a Nobel Award. Yet this same research—as again and again in the

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history of foully applied science—can be used for mass murder. The Nobel Award itself is remarkable. Where does the money come from? From Nobel, who invented new explosives—for engineering, road building, tunneling, mining. The benevolent research of Nobel himself has been malevolently applied—to the improvement of munitions, for mass killing.

Benevolent chemists produced chlorine for making antiseptics, purifying water, and manufacturing many valuable drugs, dyes, plastics. This chlorine the Germans in World War I loosed on the Allies, and so gave modern gas warfare its start.

Mass production of virus is indispensable to mass vaccination. But the development of the methods of production could be malevolent, for mass murder. The methods can be readily modified for large scale manufacture of virulent virus instead of vaccine virus. This has been done. For outstanding successes in the culture of viruses, an experimenter could win a Nobel Award. At the same time, he could have dark secrets—even better technics than those gaining fame. Miyagawa's technicians have reported on "The Large Scale Production of Virus"—cowpox virus. So have American workers, to increase the efficiency of mass vaccination for the prevention of smallpox. But close examination of the Japanese report, made in 1940, uncovers the fact that the Japanese had another idea in mind, and say so: "the culture of venereal virus" (not vaccine). They say that the same methods used for the production of cowpox virus can be adapted to the mass manufacture of venereal

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virus, but the modification is kept secret—a unique procedure in science that aims at mass saving of lives. Why should any one want venereal virus in huge quantities?

Venereal virus first gained scientific recognition in France in 1913. Syphilis is called “the great imitator.” Its disguises are practically innumerable and it can simulate the symptoms of almost any disease under the sun, from measles to arteriosclerosis (the common type of arterial loss of elasticity). Many cases of infection by venereal virus before 1913 were diagnosed as syphilis. Swellings and painless, oozing sores appear in the groin and on the reproductive organs. There is a gradual disintegration of tissue. Drugs for gonorrhea and syphilis are ineffective against venereal virus. Because of such distinctions and the development of the Frei test (comparable to the Wassermann test) for lymphogranuloma venereum, physicians in every country began to find cases of the disease. There are relatively few cases in the United States but among populations with lower standards of living, including some Oriental populations, the virus infection is not uncommon.

A decade after the discovery of the disease, medical researchers had established that the cause is a virus—invisible even under the microscope. Material from an infected gland was passed through very fine filters—fine enough to hold back any bacteria. And this material remained infective, as proved by inoculation into young monkeys.

In 1932, Matsuoka, a colleague of Miyagawa, took an important step. He obtained some virus-containing material. He obtained—incredibly enough—human guinea pigs

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from among Japanese criminals. He inoculated the former into the latter, who promptly responded with swollen glands and oozing sores. "See," he said, "you can spread this virus from man to man."

Thereupon Miyagawa put many underlings to work on the problem. The researches concentrated upon transmission of the virus—and upon culture of larger and larger quantities of the virus. Why? In 1936, Miyagawa and his associates—Mitamura, Yaoi, Ishii, and Okanashi—explained:

"It is no need to say that for the study of unknown virus of a disease, it is an inevitable requirement to find out the suitable experimental animals, in which the virus is inoculable with the production of pathological findings."

True. But why should this problem become the prime interest of the Government Institute of a government preparing for the battle of total annihilation? Venereal virus is common in the Orient. But there are many greater problems, malaria above all—the Orient's great, still spreading epidemic. To develop a life-saving vaccine? J. T. Tamura reported how such a vaccine could be cultured and inoculated into human beings. But this scheme did not work—unless to the benefit of Japanese seeking further information about the transmission of venereal virus to human beings.

Miyagawa put your Italian acquaintance, Dr. Erik G. Vio, to work with Junjiro Okanashi at the Tokyo Imperial University, and on December 20, 1937, Vio and Junjiro informed the world:

"The studies on the virus of lymphogranuloma inguinale

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have made great progress.”

Toward the development of a life-saving vaccine? No.

“Toward the development of a new brain disease—cerebral meningoencephalitis (causing speedy death in coma)—by inoculation of the virus into animal brains, and the use of such diseased brains for the increase of the venereal virus. The cerebrospinal fluid of the infected mice contains the virus in abundance. Even in the case of dilution up to 1 part in 10,000, the fluid can cause typical symptoms. . . . This method, by which we can obtain the fluid almost free from impurities, yet with a high content of the virus, will greatly aid in the investigations on the virus of this disease.”

If the Government Institute had time for developing new diseases at such a doomful date, that is surprising. More surprising is the fact: Okanashi and Vio already knew how to culture virus enough for experiments on the preparation of vaccines. More than a year previously, this success had been announced by Okanashi himself, Miyagawa himself, together with Mitamura, Yaoi, Ishii, Kanazawa, and Yamada:

“On the successful cultivation of the virus of lymphogranuloma inguinale by means of the tissue culture method and a membrane of the incubating chick embryo.”

What of Tamura’s pseudo-vaccine? Miyagawa permitted such erroneous reports to be published in American medical journals—but not in the Japanese Journal of Experimental Medicine. What did Miyagawa have to say about Tamura’s “discoveries”? “False. Though we used human pus and affected mouse brain as the virus material and

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repeated several times in every series of the experiments, the result in the cases that followed Tamura's method was negative," said the Japanese, after waiting for two years to show the mistake of their colleague.

You can search in vain for any attempt by Miyagawa to develop vaccines for prevention or treatment of venereal virus infection. None was reported, except the attempt of Tamura, who wrote mistakenly for the benefit of American researchers. If the Japanese did discover methods of manufacturing vaccines effective against venereal virus, these methods may be guarded as military secrets. To be sure, Japanese soldiers are said to be promiscuous.

Other reports on venereal virus appeared in the Japanese medical literature before Pearl Harbor. Miyagawa studied the effects of heat, cold, and dessication (drying) of the virus. If you are preparing to spread virus culture, you must first find out how resistant the virus is to man-handling and changes in the weather. The Government Institute laboratories found out how to infect not only mice, monkeys, and guinea pigs, but also many other animals, including rats, domestic fowls, squirrels, not to mention human beings.

Having developed methods of obtaining virus in quantity, there was no need to proceed to mass manufacture of venereal virus. But a final report on virus culture appeared in 1940—pages on the mass cultivation of virus for use against smallpox. And obscure within the technical wording of the report is the statement:

"This method can be adapted for use in mass production of the virus of lymphogranuloma venereum." Nothing

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more. The research ceases—or, rather, the reports on such research cease, to make way for pages on the spread of kala-azar, or Black Fever.

Miyagawa knows how to spread venereal virus culture among human beings. He does have a new weapon. His scientists have found out how to produce venereal virus on a mass scale, for good or evil. The Japanese can spread virus by animals and by mouth—by contaminating foods, water supplies, beer—like the Japanese beer that you may have seen in photographs from the South Pacific.

Another name for venereal virus infection is “climatic bubo”—from the fact that, as in bubonic plague, the lymph glands swell to make “buboes.” Do you think that the Japanese might use bubonic plague as a weapon and not use climatic bubo? Perhaps because it is the one venereal disease for which there is still no satisfactory treatment?*

As remarked by Hanson W. Baldwin, military analyst of the New York Times, on April 12, 1944, an important factor at that time delaying Allied victory in Burma and China was *venereal disease*, which was rife in the Chinese army.

**So far as the Japanese know. Recent discoveries would be military secrets. You can, however, have confidence in American research.*

IV

Spirochete Warfare

FANTASTIC schemes and evil intuitions led Miyagawa to spread Japanese culture from his labyrinth into North China, impelled Hitler into Poland, and induced madness so stark that Americans at Pearl Harbor cried out:

“Amok, amok!”

Before the Pearl Harbor attack, the suggestion that Nazis and Japanese were co-plotting destruction of the United States seemed fantastic to millions of Americans. Today, in spite of the Surgeon General’s warning, disease warfare still seems fantastic to many.

Actually, while Miyagawa in Tokyo was reporting on “bacterial warfare” in 1938, and while Hitler was en route to Warsaw in 1939, Nazi and Japanese scientists cooperated in warfare against or *with* spirochetes—in Hawaii.

Aided by Americans also, Japanese were busy with spirochetes introduced into Hawaii shortly before Pearl Harbor Day. You may not be able to believe your eyes, but you will find the proof in Nazi “medical” literature. Beginning on page 128, Volume 10 of the Nazi journal of “Pathology and Pathological Anatomy” for 1939, you can read Tokuyama’s study of Hawaiian cases of Japanese in-

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fectious jaundice, called "slime fever" by Germans. Among Tokuyama's Hawaiian cases, the mortality was 44 per cent. Consult the authorities, and you will find out that, *very definitely*, so high a mortality is attained only by Japanese strains of spirochetes of slime fever.

Suppose you consult a spirochete specialist in his laboratory at an institute devoted to research on tropical diseases. This specialist is busy, of course. But he is not as busy as he ought to be or as he will be later. He can therefore give you sufficient time to visualize the situation today.

"It is difficult, even for an expert technician, to catch and recognize a spirochete," the specialist informs you. "So here are some pictures from the gallery of the world's worst rogues."

He shows you a page from the heart of a large manual that was already open on his desk. You see three dainty depictions of the silvery, delicately spiraled thread that is the creature of syphilis. The spirals are tightly coiled, and the little creature is pointed at both ends, the better to move forward or backward.

"Bacterium?" you ask.

"No, according to the Japanese, who know the most about spirochetes, they are like bacteria in being low forms of plant life—that is, fungi. The Japanese claim that spirochetes are closely related to bacteria but are not bacteria, among which spiral forms are found. Like bacteria, spirochetes reproduce by splitting across the middle. But the Japanese think that a spirochete can also break itself into many tiny granules, each as small as the invisible molecule

of a virus, and each capable of recreating a new spirochete. Bacteria do not seem to multiply in this odd way. Certain metallic compounds, as of arsenic, mercury, bismuth, and antimony, are far more effective against certain spirochetes than against bacteria. But even these metallic compounds are ineffective against some spirochetes—for instance, *Lep-tospira icterohemorrhagiae*, the cause of slime fever, or infectious jaundice. The Japanese say that there is no drug effective against this spirochete.”

You note that the credit lines under the drawings thank Hideyo Noguchi.

“Is this a Japanese manual on syphilis or on spirochetes?”

“Heaven forbid! No, this is the American manual in general use among medical experts and laboratory technicians in the United States Army, Navy, and Public Health Service. It just so happens that the Japanese are good at this sort of thing.”

The specialist turns back to the beginning of the chapter on the study, identification, cultivation, and transmission of spirochetes.

“Look! Here is a diagram showing the main features of the different kind of spirochetes,” your specialist states. “Here you see the spirochetes of the world: the pallid spirochete of syphilis, the indistinguishably different spirochete causing yaws or tropical syphilis, the spiral of sodoku or ‘rat-poison fever,’ the spirochetes of African and European relapsing fevers. This diagram too is a copy of Japanese work. On the opposite page, you have the classification of the world’s spirochetes. It is based on Japanese ideas. This

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whole chapter is little more than a paraphrase of Japanese reports."

You find out that Inada and Ito were the great investigators of the spirochete of slime fever. When you peer closely at the dainty Japanese pictures of this spirochete, you perceive that, although at first sight it seems to be a chain of bright dots, it is really a slender thread whose spiraling gives the impression of beading. The thread is curved or hooked at one or both ends. The living spiral propels itself by rotary motion of the hook, as the Japanese discovered.

Japanese technicians took a hint from Noguchi and forced the spirochete to multiply on special jellies. The Japanese have reported that you can increase the virulence, or killing power, of these spirals by growing them in flesh and blood, of guinea pig or man.

In Japan, vaccines for prophylaxis have long been in use. But non-Japanese workers cannot make such vaccines. None but the Japanese seems to know how to use spirochete vaccines to prevent the spread of an epidemic.

Ido, Ito, and Wani found a similar spirochete in nanukayami, or "seven-day fever," a less virulent disease than slime fever. Koshina, Shiozawa and Kitayama detected a more virulent strain in akiyami, or autumn fever.

Inada has reported that the Japanese know how to get virus-like, quite invisible particles or spirochete-fragments from special cultures of spirochetes of infectious jaundice. The Japanese say that such infinitesimals can be used to infect animals and men, by spraying droplets containing

these spirochete-creating bits into the air, or spreading them through water, or scattering them in mud or damp soil. This reported technic of starting epidemics has not been tried outside Japan—so far as non-Japanese scientists are aware.

"Isn't this group of spirochetes restricted to Japan?" you may ask.

"Slime fever struck down many of Napoleon's troops during his Egyptian campaign. Except for a peculiarly virulent strain originating apparently in Japan only, the spirochetes of slime fever and related diseases are distributed all over the world, in West Africa, the Congo, along the North African coast, in Holland, the Balkans, Russia. In World War I, slime fever broke out on the Western Front, in the muddy trenches of Flanders and Italy. Recently infections have been showing up throughout Europe. Just before World War II, the spirochetes became active enough in Hawaii and the United States to attract the attention of the public health authorities. In 1941, the Journal of the American Medical Association ran an article on *Leptospirosis: A Public Health Hazard*. Leptospirosis is the name given to any infection caused by a member of the spirochete group that includes the spirals of slime fever, nanukayami, and akiyama, not to mention several other apparently related spirochetes known only to the Japanese."

"Do you suppose that the Japanese have had anything to do with these sudden new outbreaks of slime fever?"

"Why should they bother to spread it? It has been spreading without Japanese aid, just like the Japanese beetle. It

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may be theorized that American experts are just waking up to the menace, which must have been here all along, although nobody really knows. Of course, you could accuse the Japanese. And you could come very near convicting them on circumstantial evidence. Immediately before the Japanese invasion of China, Indo-China, the Dutch East Indies, and the Malay States, and shortly before the Japanese invasion of India and the Japanese strokes at Australia, the very first outbreaks of slime fever were reported from every one of these areas. The cases in Calcutta were of the peculiar Japanese type, to judge from the high mortality—60 per cent. So were the cases in Hawaii in 1939. In 1938, a sudden epizootic with a high mortality killed many dogs in California. Sixty-seven were autopsied and slime fever spirochetes were found in most of them. A veterinarian was accidentally infected by the so-called California dog strain of slime fever spirochetes and he developed the typical symptoms of Japanese infectious jaundice, but he survived. But only a very few additional cases have occurred in California, although the spirochetes are already at large universally among rats, mice, ground squirrels, and wild rodents of all kinds. The worst that is expected, however, is for a case or two to pop up every now and then, just as in the instance of bubonic plague, whose bacilli were introduced accidentally into California from the Orient years ago and are now prevalent in wild rodents in a number of western states. A strikingly similar accident has not caused very many deaths. The plague-like bacilli of tularemia, or rabbit fever, somehow got in accidentally from Japan, and

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were first discovered in Tulare County, California. Since then the germs have infected rabbits and other wild animals in every state in the nation, and hundreds of human cases have occurred. There is no need to worry because nothing can be done about it. The germs get around like the Japanese beetles.

“In 1941, seven young men went for a swim in a stream near Philadelphia. A few days later, all were down with slime fever, but only one died. You could point out that the Japanese had access to this stream. But the probability is that the spirochetes were American bred, and got into the water quite accidentally, from the kidney excretions of infected rats. Other cases have been reported from New Jersey, Connecticut, and New York. In 1942, blood tests showed that mild cases of slime fever must have been common in recent years in New York City. To be sure, Japanese epidemiologists were at large for years in New York and you can make all sorts of utterly fantastic accusations. You might even defame the great Hideyo Noguchi who was for years at the Rockefeller Institute for Medical Research. As every one knows, Noguchi was the most benevolent of men, and came over here only to help us fight spirochetes and many other germs.”

“Why did we have to call for help from the benevolent Japanese?”

“American interests lie along other lines. The same is true of the British. Just before World War II broke out, it was discovered that slime fever is common among sewer workers, miners, fish handlers, and tripe workers through-

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out England and Scotland. Of course, you could say that the Nazis or the Japanese somehow infected British rats. The truth is undoubtedly that only recently did slime fever happen to become a public health menace. If the British had looked for such spirochetes years ago in many cases of jaundice, the menace would have been brought to light then, and presumably combatted with eventual success. You can see what British and American scientists can do with fungi and virus researches when in the mood and alert. Penicillin was discovered in England. Today it is being mass produced in America. A few years ago, without aid from the Japanese, the Rockefeller Institute began a vast series of researches on yellow fever. Thanks to such tremendous efforts by peerlessly expert American medical researches, in advance of all other nations, the United States has developed a vaccine for prophylaxis against yellow fever. All troops are now protected by the vaccine. Probably even the Japanese have no such vaccine."

"But the Japanese have a vaccine for general protection against infection by slime fever and we do not?"

"American research is in progress. You can be optimistic."

"But in the meantime, what can be done to treat cases of slime fever?"

"The Japanese say that nothing can be done to treat the disease."

"Is the disease usually deadly?"

"The spirochetes of Japanese strains are very deadly. For no obvious reason, Japanese-bred spirochetes kill 40 to 60

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out of every hundred Japanese and non-Japanese victims. The mortality in African and European slime fevers is very low, from 2 to 10 or perhaps 15 per cent. One epidemic in Holland, however, just before the war killed 32 out of every 100 victims. This mortality is the closest approach ever noted to that characteristic of the virulent Japanese strain or strains. In the cases in the trenches of Flanders in World War I, the mortality was only 5 per cent. Yet the spirochetes were indistinguishable from the Japanese strains, the Japanese said."

"Were they on hand there too?"

"No, they were called in as consultants. Spirochetes were even sent to Tokyo to get the most expert opinion. Word came back that the strains were apparently the same in every way except virulence."

"What damage does the spirochete do to the victim?"

"The Japanese say that in the typical case of Japanese infectious jaundice, or slime fever, the spirochete incubates and multiplies in the body for about a week or perhaps two weeks. Then the victim suffers a sudden rigor, high fever, headache, spasms of vomiting. He is almost immediately prostrated. A few days after the onset, the skin turns yellow or greenish yellow from jaundice. In the non-Japanese mild cases of slime fever, jaundice may be completely absent. Often there are hemorrhages, especially intestinal hemorrhage. The brain covering may be attacked, and the disease then simulates meningitis. The liver is usually seriously damaged. If the patient starts to recover, he must undergo a second period of fever and a general relapse be-

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fore convalescence really begins. The patient may not be able to sleep without the aid of drugs, and delirium is a frequent symptom."

"Why can't sulfa drugs be used?"

"Simply because they have no effect on the spirochetes."

"What about penicillin? The newspapers say that penicillin is effective where other miracle drugs fail."

"That's an enthusiastic way of telling you that penicillin is effective against certain infections caused by bacteria which are not influenced by sulfa drugs. As the Japanese have pointed out, spirochetes are not bacteria. And just to give you some idea of the distance to a cure-all, the Japanese actually grow dysentery bacilli and other bacteria in cultures saturated with sulfa drugs. In this way they get strains which are not only more virulent but completely resistant to sulfa drugs. Other bacteria not affected by the most miraculous new synthetics are those of tuberculosis and leprosy. For the worst plagues there are as yet no drugs at all."

"How is slime fever spread?"

"The spirochetes multiply in the bodies of infected rats, mice, voles, bandicoots, dogs, foxes, leopards, and other animals. The kidney wastes contaminate soil, water, food, and, in fact, anything that the infected animals may run across. Laboratory workers have to wear rubber gloves in order to prevent infection through the unbroken skin and must not touch their fingers to their eyes. The spirochetes stay alive and virulent in water or any damp material, such as mud and slime, for months. In 1936, in Germany seven hundred cases were traced to bathing places. In Russia, some

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swamps seem thoroughly infested with the spirochetes, doubtless from rodent wastes. Slime on floors of slaughter houses and fish markets to which rats and mice have access may be infective. Outbreaks occur in damp mines, in military trenches, on farmlands after prolonged rains, in or near canals."

"How may the epidemics be controlled?"

"By de-ratization and perhaps by killing off all dogs in localities where the outbreaks occur. It is best to stay out of canals, dirty swimming pools, sluggish rivers, damp mines, sewers, and trenches. Avoid food with which rats or mice have come in contact. Don't drink water contaminated with spirochetes. Some years ago, a Lisbon epidemic was started by spirochetes lurking in a public fountain. Stay out of swamps and don't go to work in mud contaminated by excretions of rats, field mice, wild rodents."

"That covers a lot of ground, doesn't it?"

"So do the spirochetes. Just before the war, there were outbreaks of nanukayami and akiyami among agriculturalists—harvesters, sugar cane cutters, farmers—in Australian localities following prolonged rains."

"So even the mild Japanese types may be said to be spreading? Apparently, this manual implies that nanukayami and akiyami are restricted to Japan."

"Nobody knows for sure. There is a debate on, behind the scenes. And if you want to continue to accuse the Japanese, why should they spread the less virulent spirochetes instead of the more virulent strains? To be sure, they could have been making experiments—if you want to indulge in

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speculation. Only the Japanese really know much about the almost imperceptible differences between strains, and even Japanese experts disagree — or appear to disagree — sometimes.”

“Then diagnosis of slime fever is not easy?”

“In 1917, when slime fever broke out in the trenches, epidemiologists thought of yellow fever at first. High fever and jaundice, prostration, vomiting, liver damage. Sometimes the doctor thinks of syphilis of the liver, in an isolated case. The rigor, fever, liver injury, and certain other symptoms may suggest malaria or a severe malarial relapse, such as blackwater fever. It has been suggested that physicians be taught how to recognize slime fever. More cases are to be expected, but probably not many.”

“Won’t returning troops carry home new strains?”

“Some authorities believe so. But there are many greater menaces, such as malaria, relapsing fever, dysentery, filariasis, kala-azar, leprosy, and ill-understood fungus diseases of the skin, lungs, and brain. There is already a shortage of doctors. The shortage will be much more acute later. Not enough students are allowed to enter medical schools.”

“Why not?”

“This oversight is outside my province. You will have to find out for yourself. Still, there is little need to worry. Epidemics can be combatted efficiently when, as and if they arise. The disease has been recognized since the time of Napoleon and not so many have died for lack of medical research and other attention.”

“But the spirochetes are spreading!”

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"Only very slowly, though apparently there has been a more rapid spread recently."

"After the war, we can consult the Japanese experts. In their benevolence, they will help us."

"To be sure. Get a copy of Gustave Eckstein's book on Hideyo Noguchi and you can read four hundred pages concerning the benevolence of Japanese scientists towards the world. The public must understand that Japanese scientists are like scientists everywhere—men extremely benevolent. In another book, De Kruif's 'Microbe Hunters,' you can read of the skill and gruesome diligence of the Japanese technicians. In the chapter on 'Dr. Ehrlich's Magic Bullet' De Kruif points out that Ehrlich had to get Japanese 'to do the job that it takes the industry and the patience of the Japanese to do.' Had it not been for Ehrlich's intelligent choice of a Japanese staff to do the delicate and tedious prestidigitations with the spirochete of syphilis, Ehrlich would never have found '606,' or salvarsan, the arsenic compound used in treatment of syphilis. Shiga, Hata, and other Japanese were indispensable, because they were uniquely nimble, capable, accurate, and, above all, patient with the culture and transmission of dangerous and elusive spirals that rot the tissues of skin, bones, heart and brain."

"They find spirochetes especially fascinating?"

"And they never give up. In 1940, Masao Mujimori reported new successes in transmitting syphilis spirochetes from cultures grown for many years in the laboratories of Tokyo Imperial University — doubtless the very cultures

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started in a small way by Noguchi. Fujimori was testing out the effects of spreading two different parasites into the same guinea pig at the same time. The Japanese discovered that one parasite promotes the lethal action of the other. He demonstrated that diphtheria bacilli are more virulent when used along with syphilis germs. Sometimes the Japanese think up the damndest experiments, such as the transmission of syphilis by spraying the spirochetes into the air or into the eyes of animals or volunteers. Infection is thus accomplished. Japanese technicians have been not only the outstandingly successful cultivators of spirochetes and many other very deadly germs but also the sole successful mass producers of the most dangerous and horrible microbes. Japanese theories and reports of transmission have generally been in advance of investigations carried on in laboratories outside Japan. Some of the apparently fantastic claims of new methods of transmission by Japanese specialists have been investigated and their truth established in American laboratories years after the claims were first made. Therefore, if you want to speculate further about the possibilities of spirochete warfare, you can be sure that the Japanese know how to spread any spirochete disease — slime fever, syphilis, yaws, sodoku, relapsing fever—by spraying droplets laden with specially cultured spirochetes. So they do not have to drop infected fleas, rats, or even leopards from planes, as suggested by popular writers.

“It would cost only a few thousand yen, possibly only a few yen if you pieced out the work in homes, to produce enough spirochetes to infect a nation or even a continent.

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As to methods of broadcasting spirochetes secretly so as to avoid detection and reprisal, you yourself can probably list hundreds of different furtive technics if you put your mind on the problem for a few hours. Such broadcast spirochetes and super-spirochetes bred to order would stay alive in dust, water, damp soil, mud, food. And none would be the wiser. Cases and epidemics would not break out until the enemy had been gone for days, weeks, or even months. Accusations and counter-accusations might fill the newspapers and the air. For instance, the Dutch could have blamed the Nazis or even the Japanese for the slime fever epidemics in Holland and the outbreaks in the East Indies. The Nazis could have accused the Dutch of deliberately spreading slime fever from Dutch bathing places to German bathing places, so that thousands of slime fever cases showed up within two or three years. Can you prove or disprove the potential accusation that Japanese slime fever was deliberately introduced into Hawaii, California, Pennsylvania, and New York? For all we know, Japanese agents might have secretly sped the march of their beetles from California to New York, from Canada to Mexico—simply by picking up a few beetles here and dropping them there, entirely by ‘accident.’ But why should the enemy go to the trouble of promoting what Nature is already uncontrollably spreading throughout the continents? I think that the Japanese originally planned to leave at least a few million Americans on the continent, for use as slaves.”

“Are spirochetes really doing any significant killing anywhere?”

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"Slime fever kills its thousands, syphilis and yaws their tens of thousands, and spirochete relapsing fever its hundreds of thousands if not its millions."

"Hundreds of thousands, possibly millions—where?"

"In Africa today—where it is spread among tens of millions by ticks, lice, and bedbugs. The spirochete of relapsing fever is almost as important a killer as malaria and trypanosomiasis, or sleeping sickness. The Dark Continent is still dark, and lies in the umbra of death — without Japanese agents to make the whole scene shadowy. If all disease in Africa were to be treated efficiently, you would find the continent one great hospital and all the doctors in the world would not be numerous enough to staff it."

"What are the symptoms of relapsing fever?"

"The onset is abrupt with high fever and severe headache. After a few days, the temperature falls suddenly, and the patient then may collapse. After four to eight days, there is another sharp rise in temperature. The paroxysms of fever may appear and disappear as many as ten times. Jaundice may suggest yellow fever or even slime fever. The rise and fall of the temperature may cause confusion, too, and the physician may think of malaria or undulant fever. Other possible false diagnoses are dengue (break-bone fever) and typhus, with which the disease is often associated in great epidemics. Ten per cent of the cases may give a positive Wassermann—some say 50 or 60 per cent, in the absence of syphilis. And the spirochete can often be combatted with anti-syphilis arsenicals."

"Is the disease often fatal?"

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"The spirochete virulence varies widely. Only a small per cent may succumb, but in a few epidemics the mortality has attained 75 per cent. In West Africa in a recent epidemic extending through several years, probably 10 per cent of the entire population was killed off by spirochetes running wild from Morocco and Algiers down the Niger to Senegal and the French Sudan, southward to the Gold Coast and Nigeria. Perhaps a million natives died in this one epidemic. In India and North China recent outbreaks have not been nearly so disastrous. The World War I cases in Serbia alone numbered tens of thousands, but the mortality was low—just how low nobody knows, because typhus was raging at the same time. The disease has also been epidemic in Russia and other parts of Europe, off and on for centuries. In 1870, there were thousands of cases in the United States, 1,000 in Philadelphia, but since then there have been only sporadic cases in the east. A few score cases appear every now and then in California and Texas, where there are ticks which carry the spirochetes—for five or six years or longer, and failing to hand on the spirochetes to man, they bequeath them to their offspring. This can go on for generations. But the mortality is not high."

"Suppose new strains are introduced from Africa?"

"That has probably already happened. But not many human beings will be infected. The ticks hide out in caves as in Central Texas or on blades of grass at high altitudes as in California mountains. They wait patiently, even without food or water for years, but victims do not come along very often."

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“Could the Japanese drop infected ticks?”

“Why waste the effort? Ticks are readily discovered and dealt with. It would be simpler to find other means of broadcasting the spirochetes. What these technics might be, you will have to guess. Possibly the Japanese have not developed relapsing fever warfare to a high efficiency as yet. And, of course, yaws is a much better bet, if you are looking around for novel secret weapons.”

“Tropical syphilis?”

“So-called. Admiral C. S. Butler has always stoutly maintained that yaws is a form of syphilis, and that the syphilis spirochete has lost some of its virulence by passing through the bodies of dark-skinned races in the tropics, to which yaws is restricted. The Japanese prefer to think of syphilis as yaws whose virulence has been stepped up. In one way, yaws is more suited to disease warfare than is syphilis, though both types of spirochetes could conceivably be spread with the greatest of ease. As a matter of fact, the advocate of disease warfare is delighted at the possibilities suggested by yaws spirochetes in Kenya, Tanganyika, and Uganda, where the disease is this very day spreading like wildfire. The poor natives must think that the white man is using spirochete warfare against them, for inscrutable reasons. They know that he can halt epidemics and cure most cases but does not want to and will not.”

“How is yaws spread?”

“Yaws is more suited to disease warfare than is syphilis because the yaws spirochetes are disseminated by flies, by contact with infected objects and materials, and by personal

contact of any sort, not just sexual. That is, the disease is contagious. The slaves brought in from Africa had the habit of taking some of the discharge from yaws sores and smearing this spirochete-laden material on their youngsters. The idea was to set up an infection which apparently gave some sort of immunity to possibly worse infection in adulthood. They also practiced autoinoculation. If only one sore showed up at first, material from this lesion was smeared over the body to cause generalized infection and, it was thought, increased resistance. But they failed to link the beginning with the end, which may come after several years of secret work by the spirochetes, deep within the bones and at times the aorta.

“Three or four weeks after spirochetes get into the skin (usually through some minor abrasion), the victim suffers digestive disturbances, pains in the joints, headache at night and an irregular fever. Then at the site of infection a pimple appears and within a few days has grown to the size of a pea. The nodule is encircled by a reddish area of inflammation. The skin on the nodule cracks open, to give vent to yellowish ooze. There may be bleeding. Unless on portions of the body subjected to pressure, as feet or buttocks, the lesion is not painful. Many descriptions compare the lesion to a raspberry or a fig inside out. This so-called ‘mother yaw’ may attain a diameter of an inch or even two inches. A primary sore may or may not dry up and leave only a scar. In either case, two or three months after the first symptoms, joint pains and headache become more intense, and many raspberry-like nodules break out over the

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body. During the next few months or years, successive crops of lesions come and go. Years later, the spirochetes may rot the bones of the palate and nose, sometimes the eye.

“The Japanese, Takahasi and his co-workers, have made a careful comparative study of the effects of syphilis and yaws. Syphilis more often attacks the aorta. Both diseases can attack the same individual at the same time. Both diseases give positive Wassermann tests.”

“If cases of yaws begin to show up, just how are they to be distinguished from syphilis?”

“As far as treatment is concerned, the question is academic. Once you are sure you are not dealing with leprosy, Oriental sore, or tuberculosis of the skin, you would start the patient on a series of treatments with some arsenical—just as in syphilis. The positive Wassermann would be your guide. Yaws is more readily cured than is syphilis, although some cases are resistant and there may be relapses.”

“Is there danger of epidemics breaking out in temperate regions?”

“Not unless spirochetes are deliberately broadcast. And even then yaws would die out in the course of time where cleanliness and ordinary precautions of hygiene prevail. There would be some risk of untreated or latent cases spreading infection. Adequate treatment of cases would eradicate yaws from Africa, tropical America, the West Indies, Haiti, the Malay States, Siam, the Dutch East Indies, Burma, Indo-China, the Fiji Islands, Samoa, the Philippines and other islands of the Pacific. There are few cases in China, India, and Japan.”

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"Then yaws has been prevalent in Haiti, American Samoa, and the Philippines?"

"We gave treatment to some 400,000 cases a year for a few years in Haiti alone."

"Why did we stop?"

"Treatment is expensive and there have been other problems. Then politics always plays a part. Besides, if you start treating yaws, you are expected to go on to malaria and intestinal diseases, such as bacillary and amebic dysentery."

"Yaws and these other diseases weaken the population?"

"That should be obvious."

"If we had outbreaks of these diseases here, we could deal with them efficiently and speedily."

"So they claim. But certain diseases, such as malaria, are catching more victims right here in this country than they were fifty years ago."

"But aren't these military problems? They report that disease and not the Japanese beat us in the Philippines."

"On paper they are military problems. On paper, you could wipe out yaws in the Philippines or even malaria if you put up so many dollars and put so many to work epidemiologically."

"Then why weren't these controllable diseases controlled long ago in the Philippines, so that the population would be able to fight with maximum vigor for freedom?"

"Such an oversight is out of my province."

"How many lives would you say such an oversight has cost?"

"Hundreds of thousands of lives and millions of casualties

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in the Philippines alone, within a space of a very few years, say five. As to conditions here, I shall make no statement. I have my future to consider."

"But such figures for a population of 16,000,000 mean that war casualties are practically insignificant."

"Disease control costs money and takes more physicians and technicians than we have."

"And the Japanese know this?"

"It is as obvious to them as to us. That's why I say that the Japanese probably won't use germ warfare — with all due respect to the Surgeon General. They don't have to spread disease. It is uncontrolled and practically uncontrollable already."

"But they know how to broadcast germs in new ways, and they can culture spirochetes that we are unable to culture."

"Either that or Noguchi and his successors are great liars."

"What do you mean?"

"Recently, American scientists have thought to check up on Japanese reports of spirochete culture. It was claimed that spirochetes of yaws and syphilis can be cultured on jellies developed by Noguchi, his colleagues, and successors. Now we find that no spirochetes develop in such jellies even though the Japanese directions are followed painstakingly. Essential information must have been withheld by the Japanese. Nevertheless, it is difficult to believe that Noguchi would in his magnificent benevolence countenance such secrecy. Noguchi had a world view."

"But something seems to be wrong with Japanese techniques?"

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"Even Noguchi's. But genius makes its mistakes. And I am not defaming a great benefactor."

"Did Noguchi ever think to devise means of germ control after discovering how to culture and transmit germs in novel and very exciting ways?"

"What do you suppose his aim was all along? Of course he was working toward disease control."

"Did he ever get there?"

"Building on the foundations prepared by Noguchi, American and British scientists have gone on to prepare vaccines against yellow fever. Still, I must admit that he made a mistake about yellow fever too. He always maintained that the cause is a spirochete related to the spirochete of slime fever. Of course, we now know that yellow fever is caused by a virus."

"Didn't Noguchi know about viruses? I suppose they were before his time?"

"Oh no. He was the first to make a contribution to the culture of the virus of rabies, or hydrophobia. Japanese scientists following in his footsteps now produce rabies virus by mass technics. Why, thirty years ago, Noguchi came over here and showed the Rockefeller Institute how to culture the virus of infantile paralysis."

"Did he go on and make a contribution to control of this disease?"

"Virus culture means the ability to transmit infection. Once you transmit infections to laboratory animals, such as monkeys, you can begin to learn about control of natural transmission."

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"What about sodoku spirochetes? Have they been cultured in Japan?"

"Yes. As far back as 1917, Futaki, Takaki, Taniguchi, and Osumi reported the culture of these spirochetes. They too may have withheld essential information. Cases of this disease, once thought to be restricted to Japan, have begun to appear here and there in the United States. So American investigators have lately attempted the culture of the spirochetes, but without success."

"Just what is sodoku?"

"So means 'rat' and *doku* is the Japanese for 'poison.' The spirochetes are present in infected rats, cats, bandicoots and dogs, and are usually transmitted to human beings by bites from these animals. Don't confuse the disease with rabies. The mortality of rabies in animal or man — if the disease is allowed to develop without counteraction by the Pasteur method—is 100 per cent. The mortality of sodoku, according to the Japanese worker, Miyake, is only about 10 per cent in untreated cases. Anti-syphilis arsenicals are helpful in lowering the mortality. The Pasteur method of building up immunity against rabies is of no value. This fact might explain some of the fatalities resulting from bites of dogs or other animals in spite of the administration of Pasteur's prophylactic vaccine. In the recent outbreak of rabies in Washington, D. C., a large dog mangled a woman. She received prompt medical attention. But in a few weeks she was dead. Nobody thought of sodoku, even though cases have been reported in several different localities in the United States within the last few years."

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"In rabies, the virus has a delayed action and may not cause symptoms for weeks after the bite. Is this true of sodoku?"

"Sometimes, according to Futaki and other Japanese workers. The incubation period of the spirochete may be anywhere from a few days to six weeks. The onset of symptoms is sudden. The temperature rises very rapidly and the victim may be prostrated almost immediately. There may be severe pains in the joints and even paralysis, as in some cases of rabies. If the patient survives the first crisis, the fever subsides. Then there may be a few days of almost normal temperature, only to be followed in untreated cases by another paroxysm. Successive crises thus run on perhaps for months."

"Isn't this like relapsing fever?"

"Obviously. But diagnosis can be made by inoculating white mice with blood from the victim. According to Ozeki, if the disease is sodoku then within one or two months the mouse loses the fur from its abdomen and from the nose and around the eyes."

"Can't you recognize the spirochetes under the microscope?"

"Possibly, if you were an expert and thought to look for spirochetes within the first few days. They soon disappear from the blood. Few people in this country have ever seen such spirochetes. An ordinary doctor or laboratory technician would not know what to look for."

"Was the disease restricted to Japan until it began to show up here?"

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"Sodoku is found the world over, wherever you find rats. But the first case appeared in the United States—the first known case—in 1924. There is some evidence that cases have been going unrecognized for many years. In Japan, rat-bites are more common than elsewhere, and perhaps 25 per cent of the animals are carriers of the spirochetes, which do not seem to harm them. In some Japanese localities, more than 50 per cent of the moles are carriers. Yamanato believes that cats may be another reservoir, and other workers accuse dogs too, along with squirrels, weasels, and ferrets. The rats of Caracas, Venezuela, are 10 per cent infected, and about 20 rats out of every hundred aboard French warships at Toulon in 1933 were found to harbor such spirochetes."

"What about animals in this country?"

"No surveys have been made. In isolated studies, dogs as well as rats and mice have been found to be carriers. The only information that is reliable concerning U. S. possessions or former possessions seems to be from Japanese sources. Just before World War II, they were studying sodoku in the Philippines."

"I suppose they found new odd ways of transmitting sodoku."

"To be sure. By mouth, which means that the spirochete can get through the mucous membranes — of mouth, nose, respiratory passages, digestive tract. Later work has confirmed this discovery, and also has proved beyond a doubt that the spirochetes may easily get in by way of the eye, as in the case of all other spirochetes. Infection has thus occurred accidentally among laboratory workers. With such

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hints, some search was made among lepers in India and a few were found with sodoku spirochetes in their noses. These very same spirochetes were virulent enough to infect volunteers as well as experimental animals, particularly guinea pigs. Obviously, spirochetes are versatile. If they can't get in by one avenue, they invade by others. The Japanese, in my opinion, realize that they can't begin to compete with Nature, and would appear to have no need of doing so."

"Does this manual point up such conclusions?"

"Disease warfare is not even mentioned. Why should it be? Besides, this manual is almost six years old."

"It is dated 1943."

"1938 edition reprinted in 1943."

"No important advances made in the past five or six years?"

"Not enough to indicate a revision. The old plagues are still with us. And don't forget there's a war on. New editions are expensive in money, time, and effort. Things have to be done in a hurry too."

"Why did these Japanese have to go to the Philippines to study sodoku while so many spirochetes stayed at home in Japan?"

"Noguchi had a benevolent world view. His followers naturally seek to enlarge their horizons likewise. Tojo should have learned much from Noguchi. When the first bombs burst in Tokyo, Tojo doubtless began to realize that Japan's future would sooner or later be placed in beneficent, diligent hands like those of Noguchi's devotees.

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All epidemiologists, including the Japanese, early learn to respect the thunderbolts with which Nature wars on man secretly and openly. These natural weapons they would study and against them would try to build shields for mankind. Well knowing the practically limitless and certainly immeasurable potentialities of such weapons, they would not dare to use them lest they blast themselves. Nature, without the aid of man, is even now threatening to make of him a fossil with the dinosaurs and thousands of other extinct species, including the dodo."

In oligodynamic warfare, pigmies amok may loose the thunderbolts of the gods.

V

Black Fever, or Kala-Azar

THE murder mystery of Black Fever, an uncontrolled, syphilis-like plague made pandemic by dogs, flies, and men, is at once the darkest and the bloodiest factual account ever recorded on the pages of military history. There are a million deaths on every page. In this tragedy, men of the United States have just appeared on one scene of an act that may be only a build-up for climactic catastrophe. Before your very eyes the Japanese win nation-staggering victories by secret use of oligodynamic weapons of disease warfare.

History repeats itself, and this phenomenon excites more interest than does the lesson that history tries to teach by repetition.

Within three-quarters of a century, the Indian province of Assam has been invaded three times by agents using oligodynamic secret weapons. Three times has the lesson been taught: In Assam, Black Fever destroys the economic and military value of the population, so a rampart of empire collapses from the weight of almost weightless microbes. Then, just as Miyagawa planned, invasion of India by way of Assam and Bengal and the Presidency of Madras is made easy for the Japanese troops. But, unless the Japanese have

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already dared to go further with disease warfare than the probability of discovery and reprisal would seem to make military common sense in 1944, the Japanese invasion-by-troops will remain insignificant beside the international invasion by still uncontrollable oligodynamic animalcules of Nature's mysterious Black Fever, Oriental sore, and uta. As the Japanese are aware, disease warfare is most efficiently waged by furtive if catastrophic extension of already spreading disease. Then the enemy does not know whether his deficiencies or monstrous secret jiu-jitsu weapons are the cause of the unexpected, enormous casualties.

The Garo Hills lie in Assam. At least as early as 1869, Nature started oligodynamic warfare on the population at the foot of the Garo Hills. This was also a secret sapping of the economic and military strength of the British Empire. From the Garo Hills come the fighters to whom the British army has pointed with great pride in several wars, including World War II. The superb Indians from the Garo Hills went up the Cassino hills against terrific odds and stayed up there, starving and thirsting as the Nazis blasted the exposed positions night and day for a fortnight of early 1944. Many stirring words were spoken about the men from Assam. Everybody but the Japanese forgot what had been and was going on in the homes of these men. The Japanese, cashing in on oligodynamic warfare, began the surprise invasion of India by way of Assam and the Garo Hills. If the British had not allowed history to repeat itself, there would have been many thousands more Garo Hills fighters to export and many to leave near their homes in Assam to

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forestall the Japanese invasion. The provinces of Assam, Bengal, Bihar, and Sikkim, and the Madras Presidency would not be unhealthy for British-American forces who have to combat invisible animalcules as well as less important Japanese.

One day, about three-quarters of a century ago in Assam, a man and a dog walked into a village at the foot of the Garo Hills. The man is not known to have been a Japanese. The dog may not have been a daschund. Only the ignorant and the prejudiced would think that race or variety would have made any difference. Nature, in all her immeasurably malevolent powers, is careless of individual, race, species, genus.

Possibly the man and his dog looked healthy. Or did they have two-inch, bumpy sores never before seen by the family who took in the strangers or by any one in the village? The man's belly did bulge monstrously. But the villagers would have been surprised if this symptom of disease had been absent. Malarial parasites had swollen all the human livers and spleens in the village—and had been doing this shocking labor of hate for generations extending back to the Indian Adam and Eve, and still are thus busy in Assam and all India (and a dozen states of North America's great civilization).

There were other parasites besides those of malaria in the organs and the blood-cell forming tissues of the bones of outlandishly diseased man and dog, and in their skins. If you could have been there to examine a drop of fluid taken from infected bone marrow or spleen (by means of a hollow needle), you could have found multitudinous primitive

Black Fever, or Kala-Azar

animals in the drop underneath the lenses of your microscope.

Crowded in the drop are quiet, egg-shaped bodies—colorless, without any tiny organ of locomotion. They look for all the world (save to the most highly trained and quite alert specialist) like spores of some body-infiltrating fungus related to bread mold and yeast. They are so small that they frequently may be seen in gangs inside white blood cells, which try to eat and digest them but serve only to distribute them through the body. One white cell may gobble a lone oval parasite. The parasite feeds on the life substance of human or canine cell, grows a bit, divides in two. The two divide, to make four parasites, and so on, until there may be as many as two hundred little animals inside the white cell. This proliferation eventually bursts the white cell, and the parasites break out into the blood stream, there to be engulfed by other hungry human or canine cells, in which multiplication again goes on. In mad promotion of this pathology, the white blood cells of man or dog increase their own numbers.

If you were to permit a sandfly to feed on man or dog and so get the little insect to suck up spore-like parasites, after a few hours you could discover a second phase of the life history of the awful animalcule. Burst the gut of the sandfly after allowing the parasite-rich blood to incubate therein. Examine a drop of matter from the gut. After such incubation outside man or dog, the swarming germs show their animal nature. Each is lengthening and putting forth a slender thread, a flagellum, a whiplike organ of locomotion.

tion with which to swim about. Surprisingly, so far as is known, this locomotive whip does not develop on parasites *within the mammalian body*.

For decades, British investigators were overly fascinated (and perhaps still are) by this fascinating demonstration of morbid animalcule nature. Just because the parasites can perform this feat of turning into flagellate animals, most Britishers have thought that the animalcules have to carry through with it in the body of the sandfly before becoming infective. Non-Japanese as well as Japanese scientists have repeatedly shown that the parasites with whips are much less likely to infect dog or man or Japanese squirrel than are the spore-like, locomotionless parasites. As the Japanese have demonstrated in a startling series of studies, it is much easier to start an epidemic by mechanical transmission of the spore-like phase. You can use houseflies instead of sandflies. And you can perhaps do much more efficient work without any insects at all. In short, as the people of the Garo Hills soon found out, the disease caused by the wild animalcule is contagious—spread quite readily by contact with an infected man or dog or with contaminated food, drink, organic material (body wastes, for instance).

Back there at the foot of the Garo Hills about 1869, the infected dog and man lived long enough to distribute countless invisible tickets facilitating admission to hell on earth. As a secretly infectious carrier, dog or man may have lived out almost the average span of life. The pair freely gave spore-like parasites to sandflies, houseflies, dogs, cats, rats, children, women, and men. Animal and human populations

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soon showed that they were excellent moving jellies for the spread of culture. Soon the Indians were muttering:

“How malignant our malaria is becoming!”

Then they perceived that more than malaria was thieving their vigor and mangling them.

With a month or six weeks, in many living human bodies the spore-like animalcules had incubated and increased enough to cause a sudden high fever, sometimes preceded by a malaria-like chill together with vomiting. But the fever was frequently unlike many malarial fevers. A victim might have two distinct bouts of fever a day — for instance, one paroxysm in the afternoon would subside toward evening, only to be succeeded by a second paroxysm shortly after midnight (“double intermittent fever”). But many bodies were tortured by a more or less steady fever for a fortnight or three fortnights in a row. Within a few days after the first onset of fever, bodies began to waste away, mysteriously. The heart pumped faster and faster. You could have seen the pulsations in the carotid artery in the neck. The more susceptible died within a period of days. Others lived on and on, as the intestines were violated, the spleen and the liver became swollen to show stark bulging outlines on an emaciated frame. A peculiar symptom was noted by the villagers who lived at the foot of the Garo Hills. While anemia made much of the face pale, the natural pigmentation grew duskier over the forehead and temples, and actual blackening became obvious. Whispered and then screamed the Indians:

“Kala-azar, kala-azar!” (Black Fever, Black Fever!)

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In some skins, small pimples grew into large sores. A less shocking but more unfavorable symptom was a hemorrhage beneath the skin—at one spot or spreading spottily over the wasting body.

The most hideously afflicted were narcotized by native brewed alcohol, penned within their houses, and burned alive along with all their effects. This primitive prophylactic measure did not halt the rampant animalcules of kala-azar. The epidemic slowly became a pandemic. Everybody became infected. Wasting was universal. Many of those surviving suffered premature aging—loss of hair, drying of skin, wrinkling. Behind thin skin and prominent ribs thousands of hearts could be seen pumping swiftly on toward death.

After a year or two, the population began to show an absolute decrease. After a few years, it came to the attention of the British on the other side of the world that the Indians at the base of the Garo Hills not only were dying from surprisingly malignant “malaria or worm infection” but they could not even pay their rents. Indian troops had to be recruited elsewhere to make up for the decline in the numbers available for mercenaries. By 1882, the economic losses forced action by the Sanitary Commission, which reported back concerning the multiplicity of confusingly present-or-absent symptoms, and the astonishing mortality—75 to 98 per cent, after days or years. The survivors, years after apparent recovery, in many cases suddenly began to lose pigment from pinpoints or half-inch spots, or limb-wide areas of skin. The depigmented patches thickened. A rash appeared on many a pallid cheek, and spread around the lips

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and the nose, then after a year began to develop into yellowish pink nodules, still later into warty growths, and finally, after 10-30 years, into cancer-like tumors. But very, very few lived to attain this final horror. This "final skin eruption" began to appear among the handful who had never in all their lives had any other symptoms and who had thought themselves lucky enough to have escaped infection. Today it is believed that literally everybody may be infected in such a pandemic and that the cases which are symptomless for years may be carriers—apparently healthy if quite unhealthful spreaders.

Through the years, the disease spread throughout Assam, Bengal, Bihar, and the Madras Presidency along the whole east coast of India. An unknown number of millions have died and are in the process of dying of Black Fever.

Against this body-blackening mass killer, the British finally sent three or four epidemiologists. At first, everybody agreed with Sir Ronald Ross, the pioneer malariologist, who asserted:

"So-called kala-azar is nothing more than a severe form of malaria."

In 1903, Leishman re-studied a bit of pulp from the spleen of a soldier who had died of kala-azar three years previously, and noted spore-like animalcule bodies. Then Donovan in Madras punctured the spleen of a living kala-azar victim and remarked the same sort of egg-shaped animalcule bodies. Thereupon Ross suggested that the animalcules be named after Leishman. So in modern medical parlance, kala-azar is one form of Leishmaniasis—infection with these pecu-

liar animal microbes. But for years there was confusion and many prominent epidemiologists asserted that leishmaniasis was really a fungus-caused disease. Even today it takes a very good technician to tell spore-like Donovan-bodies (leishman-bodies) from true spores of some fungus, and an argument may continue long past the death of the patient, whose symptoms indicated any one of several different diseases. Frequently, kala-azar has been diagnosed as syphilis—"the great imitator." Like syphilis, leishmaniasis of the skin type may eat away noses and throats, as in cases of that variety of leishmaniasis called uta ("forest yaws") in Peru.

While the British "experts" were investigating kala-azar in India, other epidemiologists were finding out that this disease has world distribution—along the shores of the Mediterranean, in many areas of Africa, in Sicily, Greece, southern Russia, Transcaucasia, Turkestan, much of China. No cases have ever been reported in Japan. The skin-afflicting leishmaniasis may be known as Aleppo boil, Delhi boil, Chiclero ulcer (Yucatan), uta (Peru), American leishmaniasis, as well as Oriental sore. Just what causes Leishman's little animals to run wild at times throughout the bodies of bigger animals whereas at other times they cause only small or large sores on the skin or mucous membranes of nose and throat and mouth—nobody knows. In Italy, kala-azar and Oriental sore seem to be the same disease, causing different symptoms in different children, women, men, and dogs. Twenty years ago, Noguchi carefully detailed how to show the "differences" between cultures of Leishman's parasites from Brazil and Leishman's parasites from India and

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Leishman's parasites from Palestine or Sicily or northern Italy. Recent checking has proved that Noguchi made another big "mistake," or else withheld essential information. Those who have copied his procedures can observe no differences between the strains.

There do seem to be important differences between Black Fever in Italy and Black Fever in India. The Italians controlled an epidemic of Black Fever at Bordenaro by exterminating all the dogs. But the British say that this measure would not work in India. The universal malarial infection along with kala-azar in India may have something to do with the difference. One parasite may—nay, must—have influences on the work of the other in the same human body, or millions of dying bodies. Few people (other than the Japanese) are interested in such problems nowadays. Non-secret weapons make a lot more noise though they kill only a fraction as many as do quiet, locomotionless Donovan bodies.

Black Fever was eventually shown to have killed some millions in Bengal even before the oligodynamic man and his oligodynamic dog got to the village at the foot of the Garo Hills. For some reason, this Bengal pandemic of the Black Sixties (about 1860 to about 1870) had been overlooked and never was investigated. It must have been the source of the Assam epidemic, which by the outbreak of World War I had extended into Bihar and the Madras Presidency. Shortly after World War I, some trial was made of antimony-containing drugs in Assam and Bengal, just in time to counter (though miserably) another on-sweep of

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Donovan bodies into human bodies. Antimony was given the credit for keeping men on their feet and paying rent. And it is claimed that antimony cut the mortality rate. Nevertheless, the evidence actually indicates that Indians were building up resistance gradually through generations. The first Assam epidemic had killed almost the whole population in certain areas. Donovan bodies had gotten into virgin soil, or fresh human culture media lacking in antibodies. The epidemic of 1924 to 1926 infected hundreds of thousands (if not millions) in Assam and eventually killed uncounted hosts. Nobody really knows what the mortality was. Estimates vary from some 15 per cent of the antimony-treated cases to perhaps 80-odd per cent of the untreated (known) cases. For all that is known for sure, this may have been a second pandemic. Diagnosis is difficult, many cases are dormant for years, and only some of the cases come in for treatment. Previous, mild infection and possibly some increase in natural resistance may deserve much of the credit for lowered mortality. In Africa, Donovan bodies flooding through a population in 1932 killed 80 per cent of the antimony-treated cases, and eventually perhaps 100 per cent.

The second great visitation of kala-azar in Assam taught the British nothing. (Just then Noguchi became interested in Black Fever, and soon thereafter, the Japanese under Miyagawa.) Their very few Black Fever scientists sent home optimistic reports, in spite of which the plague came and went, as it did in Bengal, Bihar, Madras, and other provinces. The epidemiologists wrote a great deal about the

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probable importance of the sandfly as a carrier and about methods of killing them. Actually, sandflies breed almost anywhere and everywhere, indoors, outdoors, down cellar, in cracks, crevices, duck's nests, weeds, and perhaps even in sand too. In desperation the best epidemiologists actually went back to the old Garo Hills technic of burning down "infected" homes.

Early in the 1930's, the Japanese began to spread culture and to propagandize among Far Eastern peoples, Indians as well as Chinese, as everybody knows. Miyagawa told you so in plain English, as you saw on page 31:

"The Japanese are known as great germ fighters. . . . The enemy may make propaganda use of this obvious superiority."

What did the Japanese promise the Indians? An Asia healthier for the Asians than British Asia. None has tried to prove that the Japanese did not spread real germs along with germs of thought. If they did not, they were stupid. Nobody has to prove that assertion; its truth is obvious to all except certain military "experts" perhaps. Kala-azar broke out among British troops in the field in 1942, as the Japanese agents spread culture throughout the Far East.

A billion dollars spent on kala-azar research between 1903 and 1923 might have stopped World War II. There would have been more millions of healthy Chinese, Indians, Africans for Allied armies, and hundreds of millions of Far Easterners would have been inspired to fight for British freedom, which would have given them vigor and morale as well as longevous life. As it turned out, the Japanese did

the meaningful research and the culture spreading.

In 1939, the Japanese journal "Jikken Igaku Zasshi" published *some* results of years of experimentation with new, easy methods of deliberately spreading kala-azar, Oriental sore, and uta. Why publish any such military secrets? Ah, Noguchi, Mussolini, Hitler, and Miyagawa had a world view. The Japanese (and Nazis) had not enough oligodynamic experts in South America. Certain startling results would stimulate American researchers to go to work and re-investigate the still mysterious mass-murders done by Donovan bodies in Peru, Paraguay, Brazil, the Guianas, Mexico. There the virulence of skin-afflicting animalcules is greater than anywhere else in the world. Of course the Americans would publish all the secrets of throat-eating American leishmaniasis, and Japanese theories of the best modes of transmission would be put to crucial test. Concerning control of kala-azar of body entire or of skin alone, the Japanese have never put forth one iota of information, and their published work hints of monstrous secrets held for future oligodynamic use. For reasons which can only be guessed and not proved, the Japanese did not publish anything on kala-azar until 1939, and then had these reports translated into English, for reprinting in the Japanese Journal of Experimental Medicine (June 20, 1940).

It is definitely a fact and a readily demonstrable fact, as you can see by reference to the English translation of these interesting documents, that about a decade ago, Professor-Doctor Miyagawa directed Nobutari Ishii, Toshisada Sawada, and Shigeya Shimizu (and staff) to work on new

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methods of deliberately spreading cultures of kala-azar animalcules. Said Ishii and co-workers:

“Kala-azar is a disease which is widespread in the large area comprising North China and South Manchuria. There has been no primary case of this disease reported in Japan. No *Phlebotomus* (sandfly), which is presumed to be the transmission agent of kala-azar, has been found in Japan.

“The infection routes of kala-azar other than that by *Phlebotomus* — namely, the mouth and skin routes — have been mentioned by several workers. If these routes are common, then we must guard against infection spreading over our country, because Manchuria and North China are not so far from Japan, and travellers between these areas and Japan have become more frequent in the last few years. The question of infection by mouth may be assumed to have significance not only in the endemic areas but also in neighboring countries. . . .

“Eight Chinese hamsters were given ground suspension of heavily infected hamster liver. These animals were killed 92 to 408 days after infection. The smears made from spleen, liver, and bone marrow were found to be heavily infected. The suspension of *Leishmania donovani* bodies given by the mouth route easily induced intestinal and body infection in the Chinese hamsters. It is possible to consider from the results of these experiments that, in cases where feces and urine of kala-azar patients contain Leishman-Donovan bodies, infection by mouth may play an important role in the endemic areas. . . .

“Abdominal hairs of the hamsters were cut off with a pair

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of small sharp scissors in order not to injure their skin tissues. Then a drop of the suspension of heavily infected hamster liver was put for an hour on the skins. Four out of the nine animals were found infected. Next the cultured flagellates from Leishman-Donovan bodies were tried, and no infection resulted. . . .

"Leishman-Donovan bodies are able to penetrate through healthy skins, and to act as agents of body infection. Because Leishman-Donovan bodies are discharged into the excrements of the patients, skin infection must play a significant role in the endemic areas.

"Flagellate forms were inoculated directly into the brains of animals. No infection resulted. But Leishman-Donovan bodies shot into the brain or other internal organ caused infection after 100 days."

(Were the Japanese thinking of dum dum bullets? One old name for kala-azar is "dum dum fever.")

"Flagellates of Oriental sore were shot into the brains of white mice, and heavy infection resulted. Leishman-Donovan bodies more readily caused infection, however; mice whose resistance had been previously lowered in various ways were most readily infected."

You have seen that these experiments were going on for at least 400 to 500 days. But you find out that years more went into this work, which therefore must have been started not long after 1930. Note the following excerpts:

"That Chinese hamsters are suitable experimental animals has been stated by many workers. But it is not easy to obtain a sufficient supply of the hamsters in Japan; there-

fore the authors tried to breed them in Tokyo. However, after crossing many couples, we obtained only two hamster offspring. We therefore started in the hope of finding suitable experimental animals of a kind easily obtained in Japan. . . .

“A droplet of infected liver suspension was inoculated into the eye of a rabbit. Infection arose successfully two to four weeks after inoculation. This inoculation method is applicable to human beings. . . .

“Japanese striped squirrels are found in Japan and are especially abundant and easily obtained in Chosen (Korea). The squirrel is of a brown color with four black stripes on its back, and with a gray abdomen. The adults are about 6 inches in length except for the tail, which measures about 5 inches, and they are about 3 ounces in weight.

“We examined whether the Japanese squirrel was well suited for being infected with kala-azar. The squirrels were easily infected. The rate of the infection in the animals was definitely about 100 per cent, with the infection lasting over a year. And the strains of parasites in the squirrels were carried through up to over five generations with positive results. The period of marked infection begins two months after inoculation. The detailed examinations of the increase of the parasites were carried out from 1 to 321 days after inoculation. Heavy infections were noted in the intestines, and as the changes became severe the epidermis was destroyed and the parasites would be thrown out in the feces once the ulcers had been formed on the outmost lining of the intestine. The parasites were found in large numbers

in the kidneys, 100 days after infection.

"We studied in detail the changes which took place in the rabbit eyes and arrived at the conclusion that this method would be applicable in the case of this disease. . . .

"In the areas where kala-azar is endemic, it is recognized that many children are suffering from this disease. Two probabilities arise in this connection; one is that, as generally recognized, young people and animals are sensitive to the parasites; another is prenatal infection.

"We used mice for the experiments, because of the difficulty of artificially inducing conception in the case of the hamsters and the squirrels. . . . Some of the mice born from an infected mother mouse showed slight infection. . . .

"We hope that our study will be of value in the prevention of the disease."

No starting date for the first experiments are given. You can, however, fix the date of the termination of the last experiment, which involved the killing and examination of a mouse 59 days old. The mouse was born on October 5, 1937. The experiments were therefore terminated in December, 1937, and must have been started at the latest "more than five generations of Japanese striped squirrels" before December, 1937. Five generations of squirrels would take you back at least to early 1935. Before the squirrels were dragged into the tragedy, other experimentation had been under way, apparently for more than a year. In 1934, perhaps before, the Japanese knew about simple ways of transmitting and spreading kala-azar and Oriental sore. Five years passed before publication. In the meantime, kala-

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azar germs were spread as never before by secret "agents"—of Nature or Japanese. If the Japanese were so interested in helping to prevent infection, why wait until millions died from preventable epidemics?

Why should the Japanese remove all dates from their first reports? And why be sensitive about telling where the original germs were obtained? (There is no information on this significant point.) Why not make mention of human experimentation in this series, so vital to the world, whereas experimentation on human "volunteers" has been so common, *even* among the Japanese? One fact above all others is suggestive: The experiments were reported a year after Miyagawa first hinted at the possibility of germ warfare. You can sense that indeed Miyagawa was playing for keeps, and that he had some important aim in publishing this report twice within a year, once in Japanese and once in English, after deliberating on the problem and holding up the first publication for years.

There is something missing from these Japanese reports. The Japanese "forgot" to carry out or to report how to carry out an experiment to which they have been attracted again and again in more readily controllable diseases than kala-azar. When a Japanese has a cold, he sneezes or coughs out tiny droplets enriched by the presence of virus molecules and other germs. When a Japanese studies the transmission of syphilis, slime fever, and pneumonic (bubonic) plague, he puts a suspension of germs into an atomizer and pumps away. The droplets he directs into the nose or eye of rabbit, mouse, squirrel, or other "volunteer." Then he waits

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patiently for hours, days, or weeks, or even months to find out if the experiment is a success. If you study the Japanese reports carefully, you will find that Ishii and fellow scientists examined hamster and squirrel nasal passages and lungs for evidences of infection and discovered teeming Donovan bodies. But no mention whatsoever is made of the possibility of spreading these bodies by droplet infection. Yet the Japanese make reference to earlier reports which in turn hint at the possibility of successful infection by droplet technics. As early as 1932, parasites were found in the noses of kala-azar patients, and on tongues, tonsils, and in saliva. Kala-azar spread by droplet infection would be almost too good to be true, from the viewpoint of a first-rate "germ warfare" expert, such as Miyagawa, who would not dare bring up the subject of disease warfare unless he felt ready for it. Miyagawa directed the experiments of Ishii and colleagues, and he is the editor of the *Japanese Journal of Experimental Medicine*.

While Miyagawa was holding up the publication of new and easy ways of spreading Black Fever, some agent was busy in Canton, and in 1938 the increase in kala-azar cases reached epidemic proportions. The Chinese were weakened, in the face of onswEEPing Japanese invasion.

In Assam and other provinces of India, history repeated itself. In 1938, British epidemiologists were congratulating themselves. Only a few hundred thousand cases of kala-azar were coming into the clinics to beg for the prolonged, body-shaking and uncertain antimony treatment. The situation in Assam was believed to have been "stabilized" — at an

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annual new case rate of some unknown number of tens of thousands. Then in 1939, as Japanese agents got really started with their spread of culture throughout the Far East and India and opened up new ways of infiltration with remarkable foresight (as you have recently read in the newspapers), the third great visitation of Black Fever swept to the foot of the Garo Hills and swirled in multiple floods through other and great areas of India. This so-called "tropical" disease (which the Japanese, with an eye on millions of cases in North China, Manchuria, and Russia, have not listed as tropical) climbed 4,000 feet right up the Garo Hills, drove through Assam, and on to the elevations of the northern province of Sikkim—to within a hundred miles of Mount Everest in Tibet. To the west, in Bengal and then in Bihar the new pandemic raged and bodies were blackened by the million. (In that selfsame direction the Japanese drove in their 1944 invasion.) Down along the east coast, through the Madras Presidency, Leishman-Donovan bodies were wafted, somehow carried secretly in different ways by different agents, and blasted other bastions of empire. The thunderbolts of the gods were loosed. The British Empire suffered enormous economic and military losses. And today these losses are mounting. The epidemics are still unrestrained. Simultaneously, secret agents of Nature or Japanese opened oligodynamic kala-azar warfare in Cherbourg (France), Paraguay, Argentina, Brazil—not to mention the continued spread of the skin-loving parasites of *uta* in many places in South and Central America. Oligodynamic warfare leaps not just international but continental limits.

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The antimony drugs for kala-azar are true miracles—for the Japanese. According to the British epidemiologist, L. E. Napier, who has had the most extensive experience with the administration of antimony preparations and the follow-up of cases, antimony often serves to keep a kala-azar victim alive but drives the disease inward for the time being. These drugs also serve to speed the development of the disfiguring “final skin eruption” phase and makes carriers out of cases once thought to be cured. In addition, antimony drugs kill a considerable (unknown) percentage of the patients—even before the disease would normally complete its trip to the unnecessary grave. Says the tropical disease expert, Col. Richard P. Strong, Consultant to the Secretary of War and Director of Tropical Medicine, Army Medical School:

“In spite of hopeful statements in regard to treatment, advanced kala-azar is always a serious disease, and the outcome of any individual case is always more or less doubtful.”

By the time kala-azar can be diagnosed, the Leishman-Donovan bodies have been at work within the human body for weeks if not months or even years.

In view of the backfiring of the antimony-treated cases, nobody can say what the criterion of a cure actually should be. But research is in progress. And although we have sent a boy or two to do the job that may call for an army of giant intellects, favorable publicity could make this practically insignificant research sound like tremendous business. Meanwhile, millions are slowly-or-swiftly wasting away from the blackness of kala-azar. These millions could have been defending the Chinese and Indian soil to which American troops had to be sent.

VI

Tsutsugamushi Fever

DISEASE warfare is greater than mere bacterial warfare. As you have already seen, there are secret virus weapons, spirochete weapons, oligodynamic animalcule weapons of malaria, kala-azar, and many other less widely used types. In tsutsugamushi fever, also named Japanese River Fever, Kedani mite disease, Flood Fever, and Shimamushi, you encounter still another oligodynamic secret weapon—with which only the Japanese are expert and which only the Japanese know how to control, though tsutsugamushi fever has recently been turning up outside Japan.

The Japanese ought to be the authorities on tsutsugamushi fever because it has been prevalent in Nippon for ten centuries, particularly along the pleasant-appearing banks of the Shinanogawa River. Its onslaughts preceded Japanese invasions of Formosa, Korea, the Malay States, Sumatra, Indo-China, and perhaps other countries, for all that non-Japanese scientists know. In 1942, the first cases appeared on Cape York Peninsula, Australia, “accidentally” to be sure. What luck!

If you want to consult the foremost specialists, you could do no better than to refer to Japanese “medical” literature,

as American students are busy doing at present. You would learn that tsutsugamushi fever is a new oligodynamic secret weapon—a *rickettsia* germ weapon, related to that old standby, typhus, which broke out in Naples just as the American forces broke in, despite the best efforts of German science against the disease and the Americans. (Incidentally, you may find it of interest that the Paris underground reported Paris to be “lousy” — lice infested, in 1944, and ripe for typhus despite the best efforts of Nazi culture spreaders.)

If you were able to get to the Japanese experts directly, the feat could teach you all about the risks of rickettsia germs, and you might even become feverishly excited by the work of these secret weapons. But, rather than expose yourself to infectious Japanese culture, you could more safely and just as efficiently go to Miyagawa indirectly—by way of his or his colleagues' published statements. Have no doubt that Miyagawa knows what he is talking about when he speaks of rickettsia. Recently, non-Japanese scientists theorized that the virus of lymphogranuloma inguinale is really a rickettsia germ and no virus at all. And in recognition of Miyagawa's impressive successes with such cultures, they have proposed to re-name the germ *Rickettsia Miyagawanella* lymphogranulomatosis, as remarked in new textbooks on tropical medicine. But, in modesty, stupidity, or discretion, Miyagawa has himself stuck to the old name. After all, non-Japanese interest in a germ named after Miyagawa might become embarrassingly intense.

So, by reference to Japanese documents, you can get all the answers that the experts want to give you. Miyagawa

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sent the reports through the Japanese press, and is a recognized expert on rickettsia germs. You can visualize yourself in the very presence of the Hon. Professor-Doctor. Cross-question him—and you will get all the available information.

“Professor-Doctor,” you may inquire, “where would I meet tsutsugamushi fever?”

“Take a walk along any river bank in Japan. Happy-looking little field mice scamper away from your feet. It is not safe to snatch up one of these little rodents. As happy as they look, they have orange-red, living specks within their ears.”

“Are these specks the rickettsia germs?”

“These specks are Kedani mites—close kin of the red bugs, or chiggers, or harvest mites that infest many American fields in the autumn and climb up human feet and legs.

“The orange-red bugs are young blood-suckers, not insects at all but spiderlike, and as you can see by the use of a hand lens, they look for all the world like very hairy bedbugs with six legs and a tiny sucker. Their small size enables them to make their way through the pores of ordinary clothing. The mites do not pierce the skin with a proboscis, as does a mosquito. Instead, they put forth a droplet of weird chemical, thus causing a softening, as well as an unpleasant itching of the skin. Out of the invisible hole thus dissolved in the human skin there oozes a globule of serum or tissue fluid. The serum hardens and as it hardens the mite cleverly molds it into a fine tube. Through this tube the mite feeds on more tissue fluid and blood. Very efficient!”

“But where is the germ?”

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‘Inside both field mouse and mite there may be germs. The germ you may consider a huge virus or a very small globular bacterium. Not even the Japanese yet know to which group—viruses or diminutive bacteria—the germ belongs. You call such a pretty little germ a rickettsia—named after the American bacteriologist, Ricketts, who discovered the queer thing in lice infected with Mexican typhus. Ricketts died — the germ turned on him, very efficiently. Typhus is caused by one strain of rickettsia germ. Another pretty little rickettsia is the germ of tsutsugamushi fever. Very efficient, too, with excellent use of jiu-jitsu tactics. It kills at least 15 or often 60 out of every 100 victims, according to the strain. We have many, many strains, some not yet widely distributed in Nature.’

“How is the disease spread?”

“Unless accidents occur, the disease is spread naturally by the bug. The pretty little red bug gorges itself, deposits a rickettsia germ or two, and drops off to the ground. There in the soil it uses its blood food for slight growth, and then deposits scores of eggs, each perchance—efficiently enough—provided with a tsutsugamushi germ. The next generation of mites is therefore infective too, and so may be the next.”

“Where did the original huge virus, or diminutive bacterial globe, come from?”

“From some natural culture, we suppose, as some plant juice, on which mites fed ages ago, before they got blood-thirsty and took to parasitizing mice and men. Small bodies get big ideas, you know.

“For ages the germs have been cultured in mice and mites

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as two reservoirs of infection. Man himself is a third reservoir, and an excellent culture medium for increase of the rickettsia germs. The laborer, harvesting hemp along the Japanese river bank, or the sentry guarding a military laboratory, scratches the irritating deposit, and so inoculates himself. The germ does best in human flesh. Multiplying within the man, the little monster makes efficient poisons which, after a week or two, induce a rise in temperature, giddiness, delirium, headache, loss of skin sensation, deafness. A dusky rash may spread from cheeks to chest, to torso, and creep over the legs. But we have strains producing no rash. We have strains for building up resistance against our highly virulent strains."

"But non-Japanese workers say they cannot make such vaccines of weak germs for stimulating resistance against virulent germs."

"Kawamura told the world how to use such vaccines. But of course, the vaccine is treacherous. It may become hungry, very hungry, very suddenly. It is efficient originally, and hates to lose efficiency, you might say."

"Is there any treatment?"

"Military secret, so sorry. Without treatment, ten days after onset of fever, there is a crisis, which marks the beginning of convalescence or the beginning of the end. Sometimes, with some strains, not many live."

"Do you culture these strains?"

"For control studies of course. In 1935, Yoshida wrote in the Kitasato Archives of Experimental Medicine about culture in incubating eggs. Some non-Japanese workers soon

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reported improvements on our technics. Very helpful, thank you."

"Is tsutsugamushi fever restricted to Japan?"

"Not now. It is being discovered in many places outside Japan. The Kedani mite and his relatives are very efficient. Carried germs for at least a thousand years in Japan, as we have recorded, in very ancient cultural literature. Your discoverers a thousand years behind Japanese. British find tsutsugamushi fever in British Malaya in 1940, for first time. Disease must have been there all along. Allied sleeping sickness."

"A new disease?"

"The oldest."

"Can the disease be spread by other means than by mites?"

"Hayashi gave away military secrets in 1920. Very foolish. An invisible speck of infected blood can be blown into eye of guinea pig, rabbit, monkey. Spleen emulsions not so good, only last 6 hours, according to Nagayo. But much better can be done with any germ. Today any germ can be kept alive indefinitely. That is, if you know military secret. Many secrets, excellent competition, high efficiency."

"What does that mean?"

"Follow Japanese successes in medical culture closely. You will find out. Chinese say Japanese great germ fighters. Thank you."

VII

Black Death and Ohara's Disease

BLACK DEATH, the swiftest and perhaps the most efficient of all killers of human masses, may turn out to be a blessing cloaked in a horrible disguise.

So great is the action-stimulating terror of "plague" that the Japanese will probably not dare to use this supremely oligodynamic weapon directly against Americans. Of course, indirectly (and yet not so indirectly) the weapon is leading to the death of many Americans. It kills thousands of Chinese who would otherwise be alive and fighting the enemy. Against this enemy we must expend American lives in greater numbers than would be necessary if the United Nations had more Chinese troops in China and more Chinese workers in factories in China.

Your Bible relates how plague broke out among the Philistines and Canaanite troops operating against the Israelites. The European pandemic of the 14th century murdered somewhere between 25 and 70 per cent of the entire population. The mortality among the stricken seems to have been between 98 and 100 per cent—approximately what it is today when the airborne (pneumonic) strain of the germ goes to town.

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Plague had the name *Black Death* as early as the 14th century, when the Germans asserted that the name was a "natural" because of the dark hemorrhages beneath the skin and in the "buboes" or swollen lymph glands in arm-pits and groin. The name was also used because of the whole dark tragedy of Death's quickly moving picture. One day in ancient Constantinople, 10,000 people died of plague.

In the lung-loving, or pneumonic, type of plague, the germs turn all the delicate lung tissues into practically a pure culture of bacteria within 48-72 hours after the first little germ-rod gets in by way of the breath. A slight chill may mark the onset. Then there is headache. The pulse becomes faster and weaker. Fever is sudden and high. Within 24 hours after the onset, breathing is difficult and the heart is failing. The brain fades into dizzy delirium, and there is little pain, however anxious the facial expression. Coughing and gasping spew germ-rich blood from the lungs and germ-laden droplets into the air, which may be inhaled by other lungs. The red eyes lose their fire as the face turns dusky or blue. Death is quick.

In the winter especially, pneumonic plague goes rapidly through a population, unless drastic and supremely efficient health measures are taken immediately. (Your Public Health Service knows just what to do and has proved the point by doing it.)

In the bubonic type, germs get into the skin, after the bite of an infected flea from a dying or dead rat or after mere contact with contaminated material. Two to ten days later, usually only three or four days after infection, the

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temperature suddenly shoots to 103°F. or even 107°F. The head and the back ache. As the germ-poison strikes nerve centers and heart tissues, heart beat and breathing speed up. Brain injury is indicated by dullness, anxiety, then excitement—at times maniacal. Usually (in 75 out of 100 cases) the lymph glands swell to walnut-size or egg-size and are painful. Hemorrhages occur darkly beneath the skin and anywhere, sometimes everywhere, within the body. Though not as quick as in pneumonic plague, death is quick. Spread of bubonic plague is forestalled by isolation of the infected, by disinfection, perhaps by vaccination, and by annihilation of the rat population. Often bubonic plague runs wild in the rat population to cause an epizootic preceding an epidemic.

Bubonic plague germs have whims and may transform themselves within many patients into the pneumonic strain, which flies through the air without benefit of fleas and rats. The outstanding performance of the pneumonic strain has been a feature of every great epidemic. You can see that the flea and the rat may have no use in oligodynamic warfare by means of Black Death.

The last great world-sweep of plague may have taken its rise on the border of Tibet, in Yunan, China, early in the Golden Nineties. By 1894 it was at Canton, by 1896 in Calcutta and Bombay. In India about 20,000,000 deaths from plague occurred within the next three decades, but less than 10,000 die from this disease each year in present-day India. (Malaria kills 2,000,000 a year there now.) Plague went on to Singapore, the Philippines, and almost every

country in the world.

In 1894, in Hong Kong, a non-Japanese, Yersin, and a Japanese, Kitasato, raced toward discovery of the germ of plague. The Japanese discovered a germ in the blood of a victim of plague, but this little rod is said to have been the wrong one. Yersin definitely disclosed the rod that can feast on rat flesh and human flesh to cause Black Death.

In 1900, plague rods voyaged from Hong Kong to California via the bodies of Orientals, and more came into Seattle in 1907. They came to stay, and plague catches a rat-catcher or a hunter every six months or so in a dozen states of the West. Prompt measures always prevent outbreaks, and there is no use in worrying about the fact that North America as well as Central and South America is forever an endemic focus. Six months may pass before there is a death from plague. Meanwhile, thousands are dying from less spectacular diseases. And there lies a great secret of successful oligodynamic warfare: Kill thousands, tens of thousands, hundreds of thousands—but do it not too fast and use familiar killers, so familiar that people are tired of hearing about them.

Only a few die from plague in North America because not many are exposed to the rods. Of course if pneumonic plague bacilli were broadcast wholesale over the centers of population, many thousands would die despite the promptest measures. Universal inoculation with vaccine would cut down the mortality and possibly the number of infections. Anti-plague serum would still further reduce the death rate among the infected. Sulfa drugs would be helpful too—after

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infection. But such wholesale scattering of germs would require many planes, including many long-range planes—if only a few were to get through to vital centers. Though many people would die (each invisible microbe eventually killing more victims than would a blockbuster), slowly the epidemics would be brought under control. Out of control would flame the national anger. Not only would reprisals be prepared finally, but also the nation might be aroused to effective counteraction against oligodynamic weapons already in highly successful use—malaria and kala-azar, for instance. The oligodynamic raids with pneumonic plague would be immediately effective but eventually disastrous. The enemy does not have sufficient air power to annihilate this nation at one blow, and to be less efficient would mean national suicide.

For warm weather spread, the plague bacilli would have to be specially treated. Otherwise they would themselves be dead within a few days. In cold weather, the germs would be wafted around alive indefinitely. As an oligodynamic weapon, the plague germ might not prove as useful as less startling weapons, such as spores which would withstand and proceed past chlorination of water supplies, as can the hardy cysts (capsules) of that type of dysentery caused by parasitic amebas.

There is little evidence to support the view that American preparedness restrains the Japanese from use of pneumonic bacilli or bubonic rodlets. The shortage of doctors is obvious. The shortage of vaccines, serums, and drugs is obvious. For want of doctors, vaccines, serums, drugs, and even rat

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poisons, Allied troops and civilians by the thousands are dying in China and India—of plague. So the oligodynamic secret weapon of plague rodlets is being used on a tremendous scale against you—this very moment. Since Pearl Harbor Day, at least a score of distinct epidemics have been set going in China, and some are still raging. In Tokyo, Miya-gawa grins and chuckles:

“So, so sorry.”

OHARA'S DISEASE

A plague-like disease, caused by plague-like bacilli, but with only a 4 per cent mortality, has been known in Japan for more than a century. It is called Ohara's disease in Japan. Ohara's disease was accidentally introduced into California, where it was discovered in Tulare County, in 1911. Like the Japanese beetle, the rodlets of Ohara's disease have made their way into every part of the United States. Thousands of Americans surviving the viciously debilitating attack of Ohara's disease remember it vividly under other names—tularemia (the medical name), “deer-fly fever,” and “rabbit fever.” As World War II came on, the number of cases and fortunately localized epidemics mysteriously increased.

Hundreds of Americans have been caught by the rodlets from wild rabbits. Other rodlets have gotten on American skins from squirrels, woodchucks, deer-flies, ticks on sheep and dogs, cats, coyotes, opossums, skunks, muskrats, deer, quail, a sage hen, and a bull snake. In 1942, Montana stream water flowing from beaver homes upstream was found contaminated with the bacilli, which are thought to be able to penetrate the unbroken skin. It has recently been reported

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that even mosquitoes and houseflies can carry the bacilli.

The bacilli grow as rapidly as do plague bacilli, and within 24 hours (to several days) after skinning an infected wild rabbit or squirrel the unlucky hunter, butcher or cook is shaken by a chill, headache, dizziness, aches and vague roving pains, prostration, and, in rare cases, stupor. Meningitis may follow infection by way of the eye. Ulceration generally occurs at the site where the germ found entrance. For a fortnight or 3 weeks, the victim is acutely ill, then 96 out of a 100 cases begin the long—year long—convalescence.

Skipping the fact that the rods came from Japan, and the mysterious, sudden rise in number of casualties just before this war, you may find Ohara's disease of interest. Note that from this common though undramatized disease, many times as many American casualties have resulted as from the action-stimulating Black Death. Oligodynamic weapons are most efficient when they attract little attention. By the way, the next time you skin a wild rabbit or a bull snake, wear rubber gloves. Otherwise Miyagawa will be "so sorry."

VIII

Leprosy as a Weapon

FASCINATING anecdotes, first ghost-written in Dr. Victor Heiser's "An American Doctor's Odyssey," have recently been reprinted in the excellent new book, "A Treasury of Science." Some of these "scientific" stories have also been featured in popular articles in newspapers and magazines. The noteworthy anecdotes are of the Pollyanna variety and are definitely harmful because they create optimistic illusions about progress against leprosy, and not just in the Philippines but in almost every country in the world, including the United States. Such popular optimism leads to the starvation and prolonged retardation of research, which is sorely needed. The National Research Council has warned of the introduction of new cases into this country in the immediate future.

Of course, there are perhaps not as many as a thousand cases of leprosy in the United States today. But there are at least 10,000-20,000 lepers in the Philippines, 30,000 in Japan, an unknown number of tens of thousands throughout the South Pacific, 30,000 to 100,000 in South and Central America (where the disease is on the increase), 500,000 to 1,000,000 in Africa, 1,250,000 to 2,000,000 in Asia. So there

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are not just "hundreds of thousands of lepers in the world" but actually millions—how many millions nobody really knows.

Leprosy may or may not be gradually dying out in the United States (at present). But historical records demonstrate that leprosy—like every other disease on earth—alternately loses and gains virulence. Even today there are infections which cause death much more quickly than the "10 to 20 years" gradual decay often mentioned as the life expectancy.

There are phases of leprosy that are more highly infective than are other stages on the road to the grave. Besides, non-Japanese and Japanese bacteriologists have for decades been tampering with the germs in the hope of discovering how leprosy is transmitted naturally. Success along this line has been claimed by Miyagawa's servants (1940). Such success means that a potentially very virulent strain may be developed or has already been bred in mass production.

Recent non-Japanese work indicates the existence of a virus-like phase in the life history of the so-called "leprosy bacillus"—which is a little rod so closely similar to the tuberculosis rodlet that special laboratory technics must be used to tell them apart. The true cause of leprosy is not known for sure. It is believed that leprosy is transmitted only by prolonged and intimate contact with a leper or leprosy germs on contaminated materials and objects—clothing and furniture, for instance. But there is evidence that the contact need not be prolonged or intimate. Nobody really knows how leprosy is transmitted.

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Rat leprosy is a disease in rats that closely resembles human leprosy, but rats cannot be infected with human leprosy germs. It has been dubiously claimed that the Syrian hamster can be. Leprosologists for many years have been vainly hunting for animals susceptible to human leprosy infection, so that research on human leprosy could be speeded. A year before Pearl Harbor Day, mass production of human leprosy germs in the backyard hen was announced in Tokyo by two of Miyagawa's subordinates, Masao Ota and Shuichi Nitto. Previous claims had been made by other Japanese, but had been questioned by non-Japanese. Ota and Nitto presented "proof" with their last report, which included color photographs of the "leprous sores" in the hen. In the midst of battling with non-secret weapons, scientists have not yet found time to test the new Japanese technics—which may or may not be fully described in the report (which, however, appears to complete). If the Japanese have a new way of culturing human leprosy germs, then the stepping up of virulence is the logical next step—as you might guess, so that Miyagawa can make a novel contribution to "germ warfare" and the spread of Japanese culture. Are we too busy to find out for sure whether or not the Japanese really have something new—leprous hens for mass production of virulent leprosy germs?

Then American scientists might pay more attention to what the Japanese (and some non-Japanese) like to assert about leprosy transmission:

"Human infection is easiest by way of the nasal membranes, but can readily be accomplished by way of the skin."

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There might also be renewed interest in what the Leprosy Commission in the Philippines said just as "An American Doctor's Odyssey" was going to press:

"Leprosy must be considered incurable."

Follow up of the hundreds of cases which optimistic leprologists set free from Culion in the Philippines as "cured" by the miracle oil, chaulmoogra oil, has proved that at least half of them had been merely turned into secret carriers of the infection and for years went about infecting an unknown number of previously healthy people.

The official U. S. Public Health Service conclusion has recently (1942) been expressed by the famous leprologist, Dr. G. W. McCoy:

"There has been a widespread belief that chaulmoogra oil and its derivatives are valuable — specifically curative agents—in the treatment of leprosy. This belief is in shocking contrast to the views expressed by many experienced students of the disease when chaulmoogra oil is discussed privately. The oil and its derivatives are of little or no curative value. The decidedly unpleasant side-effects of the disagreeable 'remedies' probably outweigh any advantage to the patient."

According to McCoy, leprosy does not spread in the United States (though it does occur sporadically in many states) simply because the germs now in this country have a low virulence.

If you ever bring yourself to shake hands with Miyagawa, you had better wear a mask, goggles and rubber gloves, and hold your breath. Afterwards, burn everything you

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wore and bathe in 70 per cent alcohol. Otherwise, in 5 months or 5 years, you may wonder what those mysterious sores are. In the meantime, how about promoting a little leprosological research? It might help you and some less fortunate millions one of these days. "Leprosy cases will be coming in," say those who know best.

IX

Fungus Warfare

WITH disease warfare by the Japanese in mind, scrutinize the reports from their laboratories of life and death—the reports, of course, which passed the censorship of Miyagawa and other military scientists who have directed investigations and controlled the press, including the scientific press. Turn back to the early thirties, and you can get glimpses of morbidly fascinating work with rare and weird fungi. But there is a sudden cessation of such reports after 1935. Why? Have the Japanese lost interest? Or did their interest all at once become too intense for words—words that might give away military secrets?

War against, or *with*, outlandish fungi—body-infiltrating molds and tissue-devouring yeasts—definitely attracted Japanese investigators. It is possible that these men engaged in labors of love and later had to forego their benevolent researches as war with non-secret weapons demanded their entire, patriotic attention.

What subtle, fungous horrors did these Japanese look upon and toy with? What secret vegetable monsters could they have cultivated for novel disease warfare?

Examination of Japanese medical literature uncovers the

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fact that researchers got under way and may or may not have gained their goal—whatever it was or is. The experiments were risky. They dealt with highly virulent disappearing and re-appearing plant growths, whose invisible spores get into mouth, nose, throat, lungs, and sprout into visible branching and fruiting vegetation feeding zestfully on human flesh, skin, kidney, brain, eye. Man-parasitizing yeasts remain microscopic—unless cultivated in masses in jellies and rotting broths.

Here are agents that extend the scope of disease warfare beyond mere bacterial warfare and warfare with viruses, rickettsia, and animalcules. There are two great plant types: green plants and fungi. The healthful *green* plants use their green pigment, chlorophyll, to make foods for themselves and for man. Fungi are *non-green*, or chlorophyll-lacking plants. Fungi cannot synthesize their own foods and must obtain them from other forms of life and have to feed on man, lower animals, other plants, or on organic materials. Some fungi, like brewer's yeast and the mold from which the "miracle drug" penicillin is extracted, are helpful. Others have learned how to devour flesh and are parasites—such as the rod-shaped bacteria (bacilli) causing bubonic plague, the spherical bacteria (cocci) of gonorrhea and the common pneumonias, and the spiral bacteria like the scintillating corkscrews of cholera.

Medical specialists have the habit of considering the bacteria separately from other fungi. It is correct to call a bacterium a fungus, but is not common medical parlance.

Bread mold is the most familiar fungus. As you know, it

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arises as a cottony mass of threads after an invisible spore settles out of the air and germinates. The threads exude digestive juices that dissolve and so permit absorption of the starch, protein, slight amount of fat, minerals, and vitamins—for further growth into the bread. From the mat of infiltrating filaments there grow upward other threads, like stalks. On the tips of these stalks a tiny bulbous mass takes form. This bulb is a spore case, within which multitudinous living globules, or spores, are manufactured. Each spore is microscopic. Each living globule can germinate into another cottony generation of mold. The spore cases burst and release their invisible dust, which may be wafted into dark corners of your kitchen or may be blown by breezes and winds into the stratosphere. The spore-dust withstands the very lowest temperatures and long deprivation of moisture. You inhale thousands of such spores every day. But bread molds—white, green, yellow, orange, blue, or black—are not pathogenic, fortunately.

Unfortunately, pathogenic molds can be grown just as readily as bread mold or the mold that manufactures life-saving penicillin, which is an anti-bacterial agent—ineffective against virus, rickettsia, animalcule, disease-causing fungus. Sulfa drugs likewise are but anti-bacterial agents, no treatment for the effects of other secret microbic weapons.

Suppose fungus spores were widely scattered, could many men suffer infection? Have you forgotten athlete's foot, a mild infection caused by any one of a variety of moldy fungi? So-called "ringworm" is the work of fungi.

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A more serious "foot" is Madura foot, in which disease the moldy growth does not halt just beneath the superficial layers of the skin. This unpleasant disease is common in the Madras Presidency of India. It is also encountered in other parts of India, in North Africa, Italy, Greece. Tiny spores penetrate the skin through some minor break, and germinate. The fibres press on through skin, connective tissue, muscle. Their growth causes a tumorlike, slow enlargement of the foot, or, in another case, of the hand. Tubular passageways break through to the surface of the skin, and from them oozes a sticky discharge—pigmented black, white, yellow, or even red, according to the species of mold. Each species puts forth its own specific kind of spore. With a hand lens, you can perceive that the ooze is colored by swarms of granules, which are the spores. Sometimes the moldy tissue, invaded by different species at the same time, produces a mixture of colored spores.

No mycologist (investigator of molds) expects the Japanese to waste time with Madura foot. Its march is very slow, not painful, and does not lead to death unless another, or secondary, infection sets in. Nobody, not even Miyagawa, seems to have found out how to seed human flesh with the spores. Nevertheless, the Japanese have experimented with other types of fungi and have disclosed several methods of increasing their flesh-attacking power.

Japanese know their fungus history. Violent poisoning from fungus swept in great epidemics through Europe during the Dark Ages. Scores of thousands were trapped in the convulsing "flames" of St. Anthony's fire, as the disease was

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named, and died of gangrene if they lived through the convulsions. This disease is really a food poisoning — named ergotism today—and is only indirectly caused by fungus action. The fungus invades the grain-bearing heads of rye, and there develops as a hard-packed mass of threads that are rich in food materials for later germination. The threads are also rich in deadly poison, that often—in the Dark Ages, when men had no science to protect them—went into bread. In modern times, thanks to the work of mycologists, St. Anthony's fire went out—and no Japanese can rekindle it. Ergot is too easy to recognize when rye is inspected.

Noting how epidemics of St. Anthony's fire blazed across Europe, the Japanese disease-warfare experts must have been inspired to study the practicability of fungus warfare. Did ideas sparkle in their minds as they took up the problem of the vari-colored fungi of Madura foot—a precautionary consideration of the problem, for the protection of their troops and other "travellers" when India was "liberated"? If only the flesh-infiltrating ability of Madura-foot fungi could be extended—and then combined with the toxicity of ergot! But how could such an ideal weapon be brought into large scale action?

Looking about the dark realm of pathological fungi, the Japanese unearthed a *natural*—a weapon exceeding the expectations of less scientific militarists. For a time, as medical literature discloses, Japanese mycologists studied the remarkable agent, handled it thoughtfully. One must be careful. The fungus could cause the death of many of its investigators, manufacturers, and distributors. Yet, before

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they themselves perished, they could—undoubtedly—ensure the fatal infection of hosts of enemies.

The parasite that is so fascinating to experts in disease warfare is the granuloma fungus—named *Coccidioides immitis*. As Miyagawa's Japanese learned at Tokyo Imperial University, the fungus flourishes on the Japanese jelly *agar* containing a little malt extract, and remarked:

“If you obtain a spore or two from a human lung tumor or from fungus masses growing in the brain, you can cultivate creamy white colonies of the fungus on the jelly. Within a week, you have masses of fungus threads, all grown from a spore or two. More important, the creamy white colonies turn cottony and brown—because of the production of numberless, thick-walled, rugged spores—highly resistant to antiseptics. The spores dry and are swept up and away by the gentlest movement of air. Thus broadcast, the spores stay alive indefinitely—at least for years and probably for decades.”

Miyagawa can tell you more about this fascinating fungus: “Quite accidentally, laboratory workers have inhaled such invisible globules of death—very tiny, translucent capsules, bulging with dormant life-substance that is avid for human flesh. Just as on jelly, a spore comes to actively growing life on living, jelly-like human protoplasm of lung. The tiny capsule increases in size and within its spherical wall develops several still tinier spores. The larger capsule swells and bursts, to loose the smaller spores into adjacent lung tissue, blood vessels, lymph passageways between the human cells. Technicians sometimes mistake the

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fungus spores for the animalcule spores of Black Fever (kala-azar).”

The doctor, finding nodules or tubercles formed by spore action within the lungs, may at first make a tentative diagnosis of tuberculosis. Nodules arise here and there throughout the body as the streaming blood carries the spores to brain, kidney, heart muscle. Sores break out on the skin. The doctor’s diagnosis may be changed, and he has been known to suggest *syphilis*. He calls in an expert pathologist, who is familiar with such outlandish parasites and the fibrous tubercles with which the body tissues in vain try to immure them. The pathologist sees the spores within spores. From a bit of infected human flesh he obtains more spores, inoculates them into monkey, rabbit, guinea pig, or mice. They colonize the new flesh.

These colonies can be spread to malt-enriched jelly-agar. Then the pathologist wears a mask, gloves, surgical gown, as he moves about the laboratory, and takes every conceivable precaution. For now he is aware of the lethal phenomena of the fungus. No heavily infected patient survives. Pneumonia may swiftly end the patient’s mysterious chronic fever, cough, and body wasting. Or death may be delayed months, three years—or four years, with rare exceptions to this time limit set by the fungus.

Some strains of the granuloma fungus are quick and bring death within a few weeks. Virulence may be increased by growing the parasite within experimental animals, which may die within less than a week.

In fact, the most astonishing phenomenon exhibited by

fungi is their practically unique changeability. Of all the forms of life on this planet they are the very shiftest. Almost at will you can change the shape, size, virulence, and poison-resisting powers of any pathological fungus by use of a new jelly concoction or animal flesh as the culture medium for large scale manufacture of spores. By simple technics, bread mold can be modified so that it eagerly attacks jelly, potato, carrot, and meat.

A valuable fungus, whose first name is *Penicillium*, provides the "miracle drug" penicillin. Your mycologists publish, for all the world to see, the newest and most efficient methods of culturing this fungus in mass production. You may have seen moving pictures explaining the details of such wondrous mass production. The same methods are directly applicable to the large scale manufacture of granuloma fungus. But who would think that the Japanese would be so wicked as to turn our own science against us?

"There are indeed many interesting facts about fungi," remarks Miyagawa. "So resistant to common poisons are they that manufacturers of familiar antiseptics are often bedeviled by the growth of mold within their products. One species of fungus is used by chemists to test for arsenic. If arsenic murder is suspected, the chemist will put spores of the fungus into tissue obtained from the corpse and incubate the preparation. Should even minute quantities of arsenic be present, the colonies flourish and give off the positive sign: A strong odor of garlic, indicating that the fungus is synthesizing the smelly compound, arsine, made up of arsenic and hydrogen."

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It is difficult to find or synthesize drugs effective against such hardy parasites. But our present investigations must be extended, hastened. Such drugs can be found. Perhaps they have been and information about them is kept in military secrecy.

When you examine a fresh growth of any *Penicillium* fungus, like the mycologist you are struck by the picture beneath your lens. From six or eight rounded capsules that are remindful of a sketch of human wrist bones there extend short tube-like segments—amazingly like the bones of palm and fingers. The mycologist frequently remarks how closely such a fungus structure resembles the skeleton of a human hand. In the instance of one *Penicillium* species, you are looking down on the very hand of death. For this species, unlike the one from which penicillin is obtained, is the cause of a fatal broncho-pneumonia. What history will you permit this hand to write for mankind?

“Accidentally” introduced, the spores of granuloma fungus have already made history in California. During the past two decades, the fungus has caused hundreds of deaths and now California doctors are required by law to report every case of such infection to the public health experts, for the benefit of searchers into the mystery.

Molds and yeasts are helpful. Some are indispensable. Picture the Japanese sipping his rice wine, or sake. His honorable wine producers have made it for him by fermenting rice starch, first with a mold and then with a special yeast. Sake, because of the beneficial activities of co-operating mold and yeast, has an alcoholic content of 15

per cent by volume. As he sips this fungus product, the Japanese scientist may see stupendous monsters. His mind's eye follows them down labyrinths opened by Miyagawa and his fellow pioneers in disease warfare. So new this labyrinthine chaos, so stocked with marvels hitherto incredible to man!

In this armamentarium there are yeasts less pleasing than gentle ferments in their effects on the human body. These microbic plants all look very much alike and can be cultivated just as the brewer creates barrels of beneficial fungi. The individual yeast—a tiny sphere or ovoid capsule—in starch or sugar or human lung puts forth small protuberances, or buds. When the buds are pinched off, as they are within a few minutes under favorable conditions, you have several yeast globules where there had been only one. Or the yeast cell, somehow sensing oncoming unfavorable conditions of temperature or moisture, makes resistant spores within itself. The little capsules can withstand death of the host, cold as icy as you please, drying as dry as you want. The movement of air scatters them. Inhale them, and if you catch the right species, you have caught your death.

"Such potentialities must be further investigated," says Miyagawa.

And don't you agree?

The Japanese disease-warfare specialist has another rare yeast. This one has marked affinity for the human brain. The fungus enters by way of the lungs, gets into the blood, and arrives in the brain, where it promptly buds and multiplies. The colonies bulge and induce the formation of

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tumors. They may also cause inflammation of the membranes that serve as brain wrappings. The human victim wastes away as from cancer of the brain. He may become feverish and sink into a fatal coma, or "sleeping sickness." Diagnosed usually after death, the yeasty disease is called torulosis. Its power to kill is obvious. You can easily put it into mass production. You can feed its mounting millions of buds on many kinds of food besides living human brain.

You can dust enemy cities with invisible spores of death, just as you dust mosquito-breeding swamps with an arsenic-and-copper compound to kill the helpless wrigglers. You can use planes, rockets, bombs, paratroopers, guerillas, "travellers," or other means of broadcasting spores. The spores will blow about and remain virulent under all weather conditions for years. For many of these poisonous designs for mass death there is no detecting device except the human body, which gives the best evidence at autopsy.

X

Japanese Encephalitis

ALL great students of viruses and virus epidemics are wondering about the origin of the murderous influenza pandemic at the end of World War I, when the disease killed 20,000,000 children, women, and men within six months. Some say that the epidemic first sprang up in Madrid, a neutral capital (with Japanese on hand just as there are today) and spread like unutterably lethal wildfire around the world, eventually reaching even Japan.

But (as you shall see) the virus may have originated in Japan, and may have backfired, contrary to what some epidemiologists might have expected. All this is speculation, but experts are still probing the stupendous mystery. And in the meantime, they are sure of the following facts—which you can find for yourself in the American and Japanese medical literature.

Japan is the primeval den wherein have evolved (or have been evolved) diseases not only unlike those of more open areas but also virulent beyond what any epidemiologist would expect. Consider the slime spirochetes, the tsutsugamushi rickettsia, the uniquely virulent strains of that great military mass killer—bacillary dysentery—and many another

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horrible, quick-spreading, quick-destroying oligodynamic secret weapon of Nature or unnatural man.

These pestilential organisms have spread—by a providential concatenation of “accidents” — before the advancing troops of the Japanese amok.

An astonishing series of discoveries suggest darkly that influenza, St. Louis encephalitis, and Yakima Valley (Washington) encephalitis, and Australian “X disease,” as well as a form of encephalitis following influenza, may all have originated in Nippon.

An “encephalitis” is commonly called “sleeping sickness” because brain inflammation leads to prolonged lethargy or sleepiness or profound coma. The different varieties of encephalitis just mentioned are characterized by this somnolence and by slight or high fever, frequent though temporary paralysis of eye muscles (and sometimes “double vision”), and, in many cases (though not in all epidemics), by palsy-like quiverings, and mental confusion.

A peculiar sequel to some cases of influenza is what is known as Type A encephalitis. In the influenza pandemic following World War I, there were thousands of influenza victims who later (sometimes years later) developed Type A encephalitis. The mortality from Type A is about 30 per cent.

In 1924, the Japanese reported that a strange new encephalitis had suddenly broken out in the homeland, and to this disease the name Type B encephalitis, or Japanese encephalitis, was given. This particular encephalitis had high fever at the onset, stiff neck, headache. The mortality was

about 20 per cent, according to the Japanese. Until 1933 Japanese encephalitis remained more or less of a curiosity insofar as American epidemiologists were concerned.

In 1933, encephalitis broke out in St. Louis. The mortality was 20 per cent. This encephalitis was marked by high fever, stiff neck, and severe headache at the onset. Epidemiologists called it Type B encephalitis. At the Rockefeller Institute, a virus was discovered to be the cause. Soon a very similar virus was discovered to be the cause of Japanese encephalitis.

A survey of the mysteries of encephalitis viruses was reported in JAMA,* June 19, 1943, by Major Albert B. Sabin, Medical Corps, U. S. Army. This authority supplies blood-test evidence that Japanese encephalitis may already be prevalent in this country, along with the closely related St. Louis encephalitis (possibly also from Tokyo). Sabin states that Japanese encephalitis suddenly appeared in 1939 in the Maritime District of the Far East of the USSR. "X disease," which may really be Japanese encephalitis, also broke out in Australia just before World War II.

All American investigators have considered this importation of Japanese encephalitis to be quite accidental and have never made any accusations, or even thought of them (unless in secret and in whispered conversations). But from first Japanese technical descriptions of the virus and from transmission experiments on monkeys (in Tokyo and New York City), it is obvious that the viruses must be very close kin if not offspring of the same parent molecule.

*Journal of the American Medical Association.

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Other researches have brought further cause for wonderment. A virus epidemic among horses (in various localities) led to the tracing of the virus of St. Louis encephalitis to domestic animals—horses, pigs, and other animals—and to the linking of the St. Louis epidemic to a previously mysterious lethargic fever of which 50 cases appear annually in the Yakima Valley, Washington. There, as JAMA editorialized in December, 1943: St. Louis encephalitis has for years been endemic among domestic fowls and human beings in the Yakima Valley, and is carried by common mosquitoes from apparently healthy animals to man.

Japanese reports indicate that several kinds of influenza and encephalitis virus have been known in Japan for years. So did these diseases too—murderous and readily transmissible pestilences — “accidentally” originate in Japan and enter the United States by way of the West Coast? The Japanese may know the answer.

XI

Cancer-Causing Chemicals

JUST as World War I broke out in 1914, two Japanese scientists were very busy with researches having application to future wars. Sasaki and Yoshida had a few rabbits and some coal tar extract. Through weeks and through months, the Japanese pioneers repeatedly rubbed the extract on the ears of the rabbits. Into the rabbit skin went the oily chemicals—and worked silently on the life of the animals. In less than a year, the chemicals had caused tissues to start that suicidal, wild, infiltrating growth known as cancer.

This discovery was reported in 1915. Most cancer specialists were skeptical. But a few tested the new Japanese procedure. The chemicals from coal tar are indeed oligodynamic.

One half of the mortality from cancer is among people past 60, although this age group is only a small fraction of the total population. In 1915, cancer specialists believed that this high mortality from cancer in later years was caused by the so-called “senility” of the tissues.

Some years ago, the U. S. Public Health Service established the National Cancer Institute, under the direction of Dr. Carl Voegtlin, internationally famed cancer expert. At

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your Cancer Institute, the Japanese discoveries have been not only amply confirmed but also amazingly extended. As Dr. Voegtlin and other cancer researchers throughout the world point out:

“With a variety of chemicals, cancer can be induced as readily in a young organism as in an old one. The senility of an organism cannot, therefore, account for the characteristic age incidence of the disease.”

In 1939, Riojun Kinoshita, Director of the Institute for Cancer Research, Osaka Imperial University, Osaka, Japan, appeared by invitation before a group of American cancer specialists meeting at a large eastern university. Kinoshita was internationally famous. He had discovered new ways of causing cancer quickly by pure chemicals, many of which he had synthesized in his Japanese-government supported laboratories. Among these chemicals is a dye known as “Butter Yellow” once used as an artificial coloring in butter and other foods, not just in Japan but in America—up until the time American scientists got around to verifying the Japanese pioneering. (Years ago, as soon as the discovery was confirmed at cancer institutes the world over, the use of Butter Yellow for coloring foods was outlawed. You can be sure that the yellow dyes now used are quite harmless. They have been carefully tested.) Kinoshita told us Americans (truthfully):

“Even in the earliest days of cancer research, it was claimed that Scarlet Red (a dye once used to promote healing of wounds) and ortho-aminoazotoluene could accelerate tissue growth, and that these chemicals, when administered

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by mouth, could cause a cancer-like proliferation in the liver. But no definite evidence was found to prove their cancer-causing effect, notwithstanding numerous experimental attempts, until, a few years ago, the Japanese—ingenious Sasaki and diligent Yoshida—showed how to produce cancer with ortho-aminoazotoluene in the rat. . . . For several years I also have been working along these lines, with conclusive results. Upon the basis of chemical structure and the biological properties, many compounds were chosen for the experiments. Most of them were synthetically prepared and purified in my laboratory. Each compound was tested mainly by mouth. . . . I found that Butter Yellow was the most powerful cancer-producer, and much more potent than ortho-aminoazotoluene.” A great number of highly expert Japanese workers have been engaged in these researches for years—not only Kinosita, Sasaki and Yoshida, but also Nishiyama, Nakayama, Otsuka, Nagao, Nashimoto, Ueda, and their staffs, all government supported.

“To produce liver cancer,” said Kinosita, “a remarkably small dose is required. The cancer produced by such chemicals shows a high malignancy and can be transplanted from animal to animal. . . . More than 50 compounds have been found to be cancer-producers.”

Cancer specialists the world over were reluctant to admit that cancer could readily be caused by chemicals. Conservative workers opined:

“Such chemicals must be administered over a long period of time, and who can say but that the body would not develop cancer even without such chemicals?”

Cancer-Causing Chemicals

There were many hints that the Japanese had discovered much more than they were telling. Enterprising Americans went into laboratories to find out. At Yale University, Dr. W. U. Gardner forever dispensed with the old belief that cancer could not be produced within a matter of weeks by almost invisible doses of certain chemicals, possibly known to the Japanese but kept secret for military reasons. In experimental animals, Gardner produced cancer with merest droplets of powerful synthetics—administered in a single dose. Gardner's discoveries have been repeated and extended at your National Cancer Institute as well as at the Japanese Cancer Institute. Recently, it has been found possible to get a droplet of cancer-causing chemical into the lungs, which are baffled when they try to rid themselves of it. Within a short time, the chemical has done its work. Just how long such chemicals would take to cause cancer in man, nobody knows for sure. But it is definitely established that these chemicals work on man as well as on other mammals:—

These researches disclosed the secret of the remarkably high cancer rate in workers continually exposed to coal tar, aniline dyes, and certain industrial oils. And words from Kinosita and Mataro Nagayo (President, Japanese Foundation for Cancer Research, Tokyo, Japan) hint that the Japanese may have discovered the secrets of preventing such cancer—and won't tell. After all, cancer is a more efficient killer than many of the other oligodynamic weapons of the Japanese. Two years before Japan went to war with us, these prominent Japanese boasted:

“Much attention has been paid to occupational cancer,

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such as cancer of the skin developing among oil mechanics, lung cancer in miners of certain types, and bladder cancer as it occurs among workers with dye-stuffs. Japan is one of the countries in which cotton manufacturing is an important industry, but a survey of the employees, mostly young women, in the spinning mills failed to reveal an unusually high incidence of skin cancer among the oilers. Japan also contains a great many plants engaged in gas, tar, and tar by-products manufacture, but, here again, the workmen show no especially high incidence of cancer of the skin. Obviously, such a condition demands that some explanation be offered. Japanese, as a rule, bathe daily. The workmen in these industries habitually wear gloves while working. They frequently change their clothes which are often washed, and they daily take a very hot bath. In China, cancer of the penis is common, but this is not the case in Japan, a fact, due, perhaps, to the less ample facilities for bathing among the Chinese."

The explanation given by the Japanese would seem to be more humorous than scientific. Surely, there is a hint of something of vast significance in the background.

Japanese have cancer-causing chemicals which can be mixed with war gases or dissolved in mineral oil and atomized into invisible and odorless droplets for inhalation. Such chemicals would be very difficult to detect without special new equipment. As JAMA has repeatedly stated in articles and editorials, mineral oil that gets into the lungs (as frequently occurred in the heyday of oldfashioned nose drops having mineral oil as the vehicle for aromatic chemicals)

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cannot be disposed of and remains there to disturb normal physiology until death from oil pneumonia or just stays there for the rest of the "normal span of life."

Such cancer-causing chemicals can pass undetected in foods, drinks, water, and super-booby traps.

Disease warfare begins where ordinary gas warfare reaches its limits. In the face of such a threat, we continue to publish the most recent discoveries in connection with the most efficient ways of causing cancer in animals, and what the Japanese don't know already, we tell them. No other military secret is thus broadcast to the enemy. The secrets of oligodynamic warfare are the most important of all military secrets. In 1943, American researchers reported how viruses can be used to promote the action of cancer-causing chemicals and provided striking evidence of the significance of viruses in human cancer.

Why are not vast investigations under way toward the further elucidation of the secrets of cancer? Toward the discovery of means of preventing and curing cancer? Everybody who knows much about cancer says that such discoveries are coming—eventually, when Americans wake up to the fact that they literally are killing themselves by neglecting investigations of cancer. 1900 years ago, Seneca said: "Men do not die. They kill themselves."

Of course researches are in progress, even in wartime. But they are negligible in view of the size of the mystery. In the meantime, until oligodynamic warfare is waged on a greater scale by man than at present, cancer is killing many times as many as does all enemy action. From cancer of the stom-

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ach alone, every day in every year 200 men, women, and children of the United States die. In view of the ultimately preventable nature of such deaths, who is to blame if the Japanese are not?

XII

Disease Hazard No. 1 *, n. 1, 1943*

MIYAGAWA is well informed about American preparations and anti-epidemic measures. The Director of the Government Institute for Infectious Diseases, Tokyo Imperial University, has to keep up with American science as it readies itself for the predicted disease warfare. Perhaps Americans are beginning to see how terrifically powerful a Japanese secret weapon of disease can be. So Miyagawa must think. It is his duty, as well as his fascination, to read JAMA (the Journal of the American Medical Association) religiously every week. This periodical and many others are distributed throughout the neutral countries as well as the areas controlled by the United Nations. You can be sure that Miyagawa is reading a translation of the latest number of the Journal before many overworked American physicians can get to the original.

Because the Americans have repeatedly told themselves and the Japanese that disease is more important than the combined action of the most efficient non-secret weapons, Miyagawa looks through the pages of JAMA to see what new "miracle drugs" have been discovered and what new vaccines have been perfected. Recalling the continued suc-

cesses of malaria warfare, for the time being Miyagawa is more interested in American anti-malarial miracles than in advances against venereal virus and other secret weapons in preparation.

Miyagawa has learned to skip the stories like "Enter Atabrin—Exit Malaria," which are deceiving the public but not Miyagawa. He looks for the pronouncements of the technical experts who know what they are talking about. The Japanese wonders if there is anything new since Dr. Paul F. Russell, of the U. S. Army Medical Corps, summed up the facts about the three anti-malarial drugs—quinine, atabrin, and plasmochin—as follows:

"The truth is that not one will cure with certainty, and not one is a true prophylactic drug. Not one is of much value in control."

Miyagawa pays most attention to JAMA numbers such as that of May 1, 1943. In this particular number he gets an amazingly clear cross-sectional view of American progress and planning in war and postwar medical services. The Japanese is amused to perceive that he, editor of the Japanese Journal of Experimental Medicine, knew even in advance of Dr. Morris Fishbein, editor of JAMA, much of the material that was printed in this number. The former had planned it that way, for the latter, who, as everybody knows, is a very brilliant man but a very busy man too, and has to safeguard the future of no less than 150,000 doctors. Miyagawa knew in advance that malaria was going to be featured. But before reading what the experts were saying about malaria, the Japanese glances at the editor's imme-

diate interests. Despite natural professional rivalry, Miyagawa in sheer admiration reads to his subordinates a rare demonstration of foresightedness. Here is a mind indeed preoccupied with the future, with the war already in the past:

“Especially important is the trend of American medical practice as modified by lessons learned from the war. . . . There must be no all-embracing octopus-like compulsive mechanism placed on the people to make it impossible for the physician to function as a physician without enrolment in a state-controlled procedure.”

Miyagawa plans to teach American medicine some more lessons before the war is over, and so he agrees with his rival: “There must be a new international point of view.”

Disease warfare is not curbed by national boundary lines, and it teaches—in ways so ugly that you will never forget—the most primitive of all lessons to which conscious minds have been exposed:

“Complacence today—Death tomorrow!”

(What Miyagawa does not fully realize is that the editor of the *Journal of the American Medical Association*, for the good of the nation, is forced to fight not only the menace of “an all-embracing octopus-like compulsive mechanism” but also the Frankenstein which, possibly with benevolence, creates such a menace. Creator of an octopus-like mechanism is bureaucratic paternalism, whose gigantic hands sway to and fro with fatherly intentions—yet with such ignorance of practical medical science that they crush the life out of the brains they seek to help.)

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Miyagawa then turns to the sections on malaria-caused deaths today and tomorrow, and he reads the words of the eminent authority, Dr. Lowell T. Coggeshall:

"Malaria is the outstanding hazardous medical problem of the current and postwar periods."

"Still Disease Hazard No. 1," Miyagawa happily agrees. "Malaria weakens the millions and then the great, virulent mass killers can get down to more serious business. Thousands will be falling out in the streets and left to rot where they fall. Just as in the earlier Dark Age, the frenzy of utter despair will seize the few who happen to survive and they will swing into the Dancing Madness around the bodies in the gutters."

Miyagawa finds another statement from the Surgeon General:

"Outside of the mental diseases there is no other disease of comparable importance against which we have made less progress. Malaria is one of those diseases that follows wars, invading the homes of returning soldiers."

Perhaps the Americans are waking up after all, Miyagawa sighs. They are making talk about the risk. He is somewhat disconcerted by the clear warning of Lt. Col. Thomas T. Mackie, U. S. Army Medical Corps:

"War spreads diseases into northern areas—tropical diseases which have never previously been a threat. Control of tropical diseases is vital to the future safety of all the peoples of the temperate zone. Millions of combatants have been amassed in Africa, the Near East, Burma, China, and the islands of the South Pacific. When these men are de-

mobilized and return to their homes, many may be carriers of foreign infections into home areas where such infections have not previously been endemic."

"Well, after all," Miyagawa muses, "it seems as though I must have my technicians prepare some millions more of what history will come to call the 'Miyagawa cocktail.' And I had been hoping to save it for the Russians. The Americans may not die of their own sleeping sickness and the work of the agents of Nature."

Are the Americans preparing? Throughout the year Miyagawa follows closely the disease casualties. With increasing new hope he compares such casualties with the results of battle with non-secret weapons. "More casualties in Sicily from malaria attacks than from all other enemy actions combined." "Fifty per cent and often seventy per cent of all military personnel in many areas are struck down by malaria."

Miyagawa receives congratulations and is asked to make a talk before the highest military explaining the effectiveness of his super-booby traps and secret weapon of malaria—this time, just malaria alone, preliminary Secret Weapon No. 1.

"As you know, Honorable Tojo and Honorable Military Servants of the Divine Emperor," Miyagawa explains, "for years we trained our assault forces in malarial jungles as preparation for the capture of Indo-China, Netherlands Indies, Burma, Siam, South China, Malaya, the islands of the South Pacific, India, and southern United States, where a dozen states have more malaria than ever before. Every

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Japanese was provided with quinine, as the defenders rarely were, thanks to sleeping sickness. Japanese epidemiologists were ready. So unready were Americans that high authorities are afraid to mention the failure to develop sources of quinine—a little oversight a thousand times more disastrous than the sleepiness at Pearl Harbor.

“Japanese scientists knew that more than a half century of research indicates the high improbability of the development of any vaccine or serum against malaria. Japan's own scientists long studied the problem. They observed the transmission, the treatment (so-called), and the efforts at control of malaria. The Japanese medical corps was quite aware that, to control malaria, you must drain or otherwise permanently ruin the breeding places of the mosquito which carries malaria from man to man—the anopheles mosquito. Drainage of swamps is slow, expensive—too expensive even for American states, all 48 of which today have many different kinds of anopheles waiting for our virulent parasites. Even oiling or use of colloidal Paris green on breeding places is often impossible under war conditions. And the anopheles mosquito breeds not only in swamps but also in streams, ponds, lakes, puddles, and collections of water in coconut shells, cacao-nut shells, crotches of trees, empty shell casings.

“In the beginning malaria was an offensive weapon. To meet the invading Japanese forces, the defenders had to go out into the jungle and into swamps—and get bitten by infected mosquitoes. The defenders were on short rations of anti-malarial drugs.

“The Japanese knew how to infect hundreds of thousands, nay millions of mosquitoes. Usually, as in the Philippines, such infection had already been accomplished for us.

“Trillions of anopheles mosquitoes lay their almost microscopic eggs on water surfaces. Within three days, each egg hatches into an eighth-inch wriggler or larva, which feeds on tiny green water plants. The larva grows, and molts several times. Finally, it metamorphoses into a comma-like, fat pupa—after about ten days. In 48-72 hours, the back of the pupa splits open, and the two-winged, six-legged vector of death struggles out, to stand on the empty pupa case as on a raft, to dry its wings for fifteen minutes, before taking off.

“The adult female, but not the male (which feeds on plant juices), goes off in search of a meal of blood, needed for the optimal nutrition of egg-forming tissues. The female searches food — blood—every three or four days, and may continue to do so for weeks if not months. She comes upon a man, woman, or child with malarial parasites swarming in the human carrier’s blood. She craftily darts at the ankle or back of the neck, or if it is dark and the human carrier is quiet, she alights at any convenient site.

“In goes the point of the proboscis. She injects a droplet of saliva, which contains some chemical that slows blood clotting and causes itching. Then she sucks blood containing a few tiny animals — malaria parasites, smaller than human red cells. Gorged, she flies away, to lay her hundreds of little eggs. Within a few hours, parasites have wormed their way into the mosquito’s stomach lining, there to feed

and grow, and multiply. In two weeks, there are small cysts within the mosquito's stomach lining. Each cyst is a rounded mass of needle-like parasites. The cysts burst. The wriggling needles crowd on toward the salivary glands. There they wait. Now there is death lurking in saliva, death for Americans and British and Russians.

"The anopheles bites again. In goes a bit of saliva—and many wriggling malaria parasites — into a second human blood stream. Before she is gorged she may have infected several marines, soldiers, sailors, civilians. The living needles pierce red blood cells, grow in them, multiply in them, burst them, and go free to attack and multiply within other blood cells.

"By the end of a couple of weeks, it may happen that the infected man can tell when millions of invisible animals burst out of his red blood cells. They let loose their own special brand of poison, which induces chills, then high fever, then chills, and fever again. Sometimes infected men are not at first aware of their swarming parasites; such cases may become carriers and infect enough mosquitoes to cause an epidemic whose source remains a mystery. The parasites may crowd into the brain's blood vessels, and without quinine to kill parasites (or to stimulate the victim's body tissues to put forth chemicals that kill parasites), the patient may die of cerebral malaria — with a few days. Quinine stops chills, reduces fever, keeps a man on his feet, may one day bring about a cure. Often a man harbors malaria parasites for years. Years after infection has apparently been cured, the man may suddenly fall prey to mysteriously stim-

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ulated and teeming malarial animalcules. He may sink into the ill-understood 'blackwater fever'—in which the urine is dark with blood from damaged kidneys or other organs—and for which there is no treatment.

"As we knew in advance, the roads to Tokyo would be difficult, principally on account of malaria. We planned it that way. We took territory—jungle and swamp—thousands of square miles of it, to place ourselves beyond the reach of enemy arms, to defend our new empire while industrialization was going on, to prepare for larger conquests, by non-secret and secret weapons. Why are jungles and swamps particularly hazardous? Chiefly because of malaria. Malaria became a defensive weapon, perhaps none too secret, but one largely ignored by Americans whose sleeping sickness makes them believe that visible weapons are the most effective.

"How carefully the Government Institute for Infectious Diseases prepared the malarial weapon!—though malaria is not contagious and requires winged allies, the anopheles, gratifyingly willing—and ignored by those with sleeping sickness. You can readily find documents summarizing the advance work at Japanese scientific congresses. We studied Philippine mosquitoes as well as Chinese. Incredibly, through some stupidity on the part of a revolutionary, even the Americans could have read of hill-stream breeders in our literature — though they had forgotten the lessons of Macedonia. This revolutionary, with mistaken benevolence, permitted publication of some of the proceedings of the 9th Congress of the Japanese Society of Parasitology held

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in Tokyo, April 1937, but the enemy did not note our benevolent interest in China's malaria problem and that of the Philippines. May I quote from the Proceedings of the Congress:

“ ‘It is gratifying to note that recently students of tropical medicine and medical entomology have gradually taken up the study of mosquito fauna in China. . . . Owing to the immense area of the country and its varied physiological features, careful study of these insects in different regions is required before enough information can be gathered to enable us to understand this important tribe of mosquitoes and its relation to diseases in this country. Heretofore, study of the mosquito has been limited to some of the sea ports and big centers in China. The mosquitoes of interior parts of the country are practically unknown to the scientific world. This is especially true of the southeastern hilly provinces, where, owing to the difficulty of travelling, very few people have had a chance to collect these insects.

“ ‘The main anopheline carrier of malaria—*Anopheles sinensis*—is generally distributed throughout the 17 districts visited in the four provinces of Kwansi, Yunnan, Kweichow, and Szechuan. It is interesting to note that *Anopheles sinensis*, here as elsewhere in China, prefers to breed in rice fields, pools, ponds, or ditches but, in the absence of more favorable breeding places, will breed practically anywhere—in spring water under dense shade, seepages, swampy ground in a thick forest, and a sandy pool without any vegetation. . . . Mosquitoes were caught in houses and dissected under magnifying lenses. Malaria-parasite cysts were

found in many mosquito stomachs, especially in localities where epidemics were serious. . . . *Anopheles sinensis* is the chief transmitter in the flat regions. But, in the absence of more important malaria-carrying species, *Anopheles sinensis* can act as a carrier practically anywhere. . . . At Chungking, *Anopheles philippinensis*, common in the Philippines, is reported for the first time. . . . Contrary to previous scientific opinion on malaria in Southwestern China, it was found that malarial mosquitoes can readily breed and transmit malaria at elevations of more than 4,500 feet above sea level. . . . A number of mosquitoes were rendered infectious in the laboratory by being allowed to feed on a soldier with malarial parasites in his blood.' ”

Tojo frowns and asks:

“Was it not a mistake to let the enemy know about these hill-breeders?”

“I was humiliated when I perceived the publication of the Proceedings—but, of course, Chinese were present at the Congress. And, although the Proceedings were translated into English, you can tell how insignificant this oversight actually turned out to be. I quote from an article by a U. S. Bureau of Entomology expert, Dr. Stage, in the *National Geographic Magazine* for February 1944:

“ ‘In the Philippines, our Army tried to cut down malaria by encamping on high ground, only to find a hill-stream malarial mosquito, which at once infected our troops there. . . . In Macedonia, such an epidemic was one of the biggest medical surprises of World War I.’ Enemies with sleeping sickness can be repeatedly surprised, with the very same

weapon.”

Miyagawa is asked another question:

“Are the Americans coming out of their sleeping sickness?”

“You would think so to read some of their official statements. Here is an official statement on ‘Tropical Diseases in Returning Military Personnel’ copied in JAMA, December 18, 1943:

“ ‘Publication of this statement has been requested by the Subcommittee on Tropical Diseases of the National Research Council. The statement has the approval of the Division of Medical Sciences, National Research Council, and of the Surgeons General of the Army, Navy, and Public Health Services.

“ ‘The military forces of the United States operating in tropical and subtropical areas are exposed to a number of diseases which occur only in those areas or are much more prevalent there than in this country. Some of these diseases will be brought back to this country in returning military personnel and may be seen by civilian practitioners of medicine either in persons infected abroad or in persons to whom the diseases have spread from the original cases. It is important that physicians be familiar with the diseases which may be imported, and that they be on the alert to diagnose and treat them correctly and to prevent their spread.’ ”

“Ah, Miyagawa, they are awake.”

“Wait, here is much more of interest:

“ ‘Malaria is the most important of these diseases. In

most tropical regions the severe form of the disease (falciparum malaria) predominates. Neither quinine nor atabrin prevents malarial infection. Suppressive treatment, formerly incorrectly termed *drug prophylaxis*, will usually prevent clinical symptoms and keep infected persons on their feet as long as they continue such treatment, but many of them come down with clinical malaria within a few weeks after stopping treatment. Malaria is prone to relapse several times even after supposedly adequate courses of treatment. Some military and civilian personnel, returning to this country by air, become infected while stopping in highly malarious areas en route. These persons have their first attack of malaria after arriving in this country. The attack is usually of the severe type—falciparum malaria. The symptoms may be obscure and the disease not suspected, and coma or even death may ensue before diagnosis is made.’ ”

“Oh, so the official statement proves that even the airports are not yet protected.”

“Obviously they are not. I continue,” says Miyagawa, “with words from the United States:

“ ‘Malaria should be suspected in every person returning from the tropics or subtropics. The disease may simulate almost any acute or chronic abdominal condition, upper respiratory or pulmonary conditions, meningitis, encephalitis, coma from other causes, or primary or secondary anemia. . . . Vigorous treatment must be instituted promptly to avoid fatalities and to diminish the incidence of relapses.

“ ‘It is possible that local outbreaks of malaria may occur

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in this country, starting from relapsing cases acquired abroad. The United States Public Health Service recognizes this possibility, is already cooperating with certain states in intensive anti-mosquito programs and is prepared to act vigorously if epidemics occur.' ”

“But, Honorable Miyagawa, the malaria problem in the United States has been solved, and only local outbreaks are expected. Here is information as of February 1944, official statements from government authorities writing in the *American Journal of Public Health* and having summaries printed widely in the U. S. newspapers:

“ ‘Mobile units, made up of teams of technicians and epidemiologists, have been organized to deal with small explosive outbreaks that may result from the advent of returned troops.’

“Major O. R. McCoy, of the Tropical Disease Control Section, Office of the Surgeon General, promises further aid:

“ ‘Where local authorities do not have the personnel, supplies, or equipment to conduct anti-malarial work, the United States Public Health Service, with its special organization for malaria control, is prepared to give immediate help when asked to do so by the State Department of Health.’

“Other authorities say that malaria will take care of itself. Dr. R. E. Dyer, Director, National Institute of Health, U. S. Public Health Service asserts:

“ ‘Malaria probably will not become a public health problem in this country.’ And the Surgeon General claims, despite his earlier warnings:

“ ‘It is believed that history will repeat itself and that such

outbreaks will die out, because, as in the past, the environment is not favorable to perpetuate the infection.' Tell me, Miyagawa, what is the miracle drug that has removed the problem of malaria so speedily from the American continent?"

"Honorable Tojo, it is the miracle drug known for centuries as campaign soothing syrup."

"Ah, it is 1944. But what proof have you that the political appointees do not speak the whole truth?"

"Let me quote from the U. S. Infantry Journal, published simultaneously with the statements from the administrators of soothing syrup:

" 'An interoffice communication, written by a general officer in one of our most active theaters, complains that commanders of units going into the front are very anxious for their troops to know how to conceal themselves from the enemy, how to defend themselves when attacked by bayonets, how to avoid poisonous snakes, how to conserve strength—and all for one purpose—namely, the conservation of manpower. Yet these same commanders stand to lose from 40 to 70 per cent of their men from malarious infection and still do not make any effort to master the technic of preventing the disease. In one war theater, casualties among Americans range from 2½ to 5 times as many from malaria as from all other factors combined, including enemy action.' "

"Aren't those your optimistic words, Honorable Miyagawa?"

"No, they are more optimistic than mine of sometime

ago. You can read a copy of this complaint in the New York Times for March 12, 1944."

"What about the American home front? Epidemics will be taken care of as they break out, won't they?"

"Honorable Tojo, my information is from non-political sources. *Time* magazine states that there are 3,000,000 cases of malaria in the United States this very day. The New York Times says 3,500,000. These figures are, in all probability, from the American Chemical Society whose scientists state that the number of cases of malaria in the United States is between three million and four million."

"The mobile units must already be pre-occupied, even before the troops return. Do you mean to say that the exact number of cases in the United States is unknown?"

"I quote from the 1943 (sixth) edition of the American treatise, 'Diagnosis, Prevention, and Treatment of Tropical Diseases,' by Admiral Stitt of the U. S. Navy and Col. Richard P. Strong, of the U. S. Army Medical Corps, and Consultant to the Secretary of War and Director of Tropical Medicine, Army Medical School, Washington, D. C.:

" 'It is unfortunate that we have no accurate statistics of the cases of malaria which occur annually in the United States. . . . In 11 of the southern states, malaria still remains a major public health problem, and in a few is a leading cause of death. Malaria has recently become an increasing menace to life and to economic development in certain sections of the southern states. It has not been adequately attacked in some localities.' "

"Honorable Miyagawa, has this situation changed?"

"No. He who says that, in the United States, malaria may not *become* a public health problem, speaks truly. It has been a public health problem for centuries and as Stitt and Strong point out, recently has loomed as an increasing menace. The mobile units must be buzzing about like bees. Later—well, just wait. And you won't have long to wait."

Even today, Japan has astronomical numbers of winged allies. Her airpower is still unconquered, and will for decades remain formidable—though Japan's every plane has been blown apart.

In the meantime, super-booby traps catch thousands of American troops landing on islands "abandoned" by the enemy, except for a few diseased (mosquito infecting) Japanese, each the source of thousands of infected mosquitoes, each able to start an epidemic in the Pacific or in America.

A "minor pre-Pearl Harbor oversight" may cost the United States millions of casualties in this and later generations.

Note what is going on in India this very day. As an editorial in JAMA tells you:

"In India, malaria is today the major cause of poverty and of lowered physical and intellectual standards."

XIII

Invention of New Secret Weapons

MILITARY "experts" have frequently related how the British were blasted by non-secret weapons from Gallipoli in World War I. But epidemiologists point out that oligodynamic agents really caused the defeat. From bacillary dysentery alone, the British suffered 100,000 casualties. On Bataan, in World War II, bacillary dysentery was second only to malaria among the causes of our defeat by Japanese secret weapons.

This disease has disrupted military plans in almost every war since wars began, and is still nowhere near defeat—although you may have read of "miracle drugs against bacillary dysentery at the front." Against even terrific threats we send a few haphazard "investigators"—who are always foolishly optimistic, as recent history has proved. And our experts are fully aware:

"According to Shiga and other Japanese scientists, the mortality from Japanese strains of dysentery bacilli is higher (20 to 50 per cent of the men infected) than the mortality from any other strains on earth. The Japanese ever since the beginning of scientific work on this important military problem have made all the outstandingly significant reports

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—except the report that sulfa drugs are sometimes helpful. Throughout military history, bacillary dysentery has repeatedly become the most important military disease. In World War I, out of every 100 German soldiers who died from disease, 4 deaths were from dysentery.”

The rodlets are spread by flies, by carriers, by contact with material from infected men, by contaminated food and water, by slightly moist dust “accidentally” blown about.

Once in the body, the germ incubates for 24 hours or more, then very suddenly causes bloody diarrhea, severe colicky pains, but often only a slight fever. The victim may not appear very ill. Nevertheless, the disease causes rapid sinking toward collapse, and the patient may die within a few days. A considerable percentage of cases that get back on their feet are carriers, infect others, and eventually die of some complication, such as pneumonia.

The rodlet causing bacillary dysentery was discovered in Japan by Shiga in 1898, and the germ is named after him. In fact, there is a great group of closely related bacteria named after him—the *Shigella* group, all of them famous killers. There are several different *Shigella* bacilli all causing the same sort of dysentery. Two of these are known as Shiga and Ohno, respectively. And the Japanese have discovered how to invent new types, bred from old, familiar germs—including germs causing epidemics in the Philippines as far back as 1905. The Japanese were there studying the epidemics, by invitation.

The modern (American) classification of these germs is based on the work of the Japanese, Shina, who proposed

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the system in 1936, probably with a view toward aiding U. S. efforts to control bacillary dysentery in China, the Philippines, and Hawaii, not to mention a number of areas of the continental United States. Iguchi announced a new vaccine in 1932, but kept back (presumably as military secrets) the essential details.

Well aware that many strains of dysentery bacilli are more virulent and more resistant to sulfa drugs than are others, the Japanese have been breeding scores of new strains within the past few years.

As shown by a 1936 report from the 3rd Bacterio-Serological Laboratory of Tokyo's Government Institute for Infectious Diseases, Professor-Doctor Seigo Hosoya has built up a vast battery of different strains—for instance, *Shigella-bacillus* Type Komagome A, Type Komagome B III, and just plain "Shiga type," the great-grandfather of them all. Kiyoshi Kobayashi, reporting new investigations conducted under the direction of Hosoya, hints at many other breeds, and tells how he creates "pure breeds" by use of special diets for the germs when they are being cultivated outside the human body.

A bare inkling of the vast scope of Japanese bacterio-inventive genius at work perfecting bacteria for oligodynamic warfare was let out by Kiyosha Hayakawa, reporting from the second research department of the same government institute "for" infectious diseases. Hayakawa tells how certain secret (definitely secret) Japanese technics have been used to modify (endlessly) Shiga rods and any close kin of them. So, as you can see, if you want a new germ, one for

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which there is no treatment as yet, no serum, no vaccine, nor any miracle drug, you can give your specifications to Hayakawa and he will soon fill the order, with virulence guaranteed, and mass production methods available.

Hayakawa writes:

“From germs collected conscientiously from several epidemics, scores of new bacilli have been brought into being, forms never seen before. These researches are the fruition of recent years of research and numerous investigations on such variation.”

Hayakawa hints at the unpublished successes of innumerable Japanese, many working in the laboratory of Professor-Doctor Kozo Saisawa, “for whose constant and generous guidance throughout this work sincere gratitude is due.” No hope is expressed this time that the new germs will lead to the control of later epidemics caused by the parent bacilli.

This report has been carefully censored, as any bacteriologist can see. No indication of the locations of the epidemics is given and there is no explanation as to how the Japanese happened to be on hand at every epidemic. No information, no detail, of possible technical value to a possible enemy is allowed to pass the military threshold of Tokyo's labyrinthine government institute for infectious diseases. Worthy of contemplation is what is missing. There are three illustrative plates, showing the fascinating growth on laboratory jellies; these plates are numbered VII, VIII, IX. The first six plates have not been published anywhere, although their existence is obvious from references to them made by the careful Japanese. Possibly an oversight of the editor, Miyag-

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awa, who may be "so sorry."

Hayakawa speaks vaguely of the erroneous views of non-Japanese microbe hunters, who do not yet know all the general types of modifications possible in the case of any bacillus or virus or rickettsia or fungus. If you study the report, you will find bare mention of the building up of impressively varied batteries of lethal fungi—Kamakura S, Chiba No. 99, R and O variants of Chiba No. 99, R Type of Nakano strain, "least wrinkled type R of Hashimoyo strain," "Modified R subvariant of Tadano strain," and many other types that are utter secrets to non-Japanese scientists.

The expert claims that by "suitable technics," whiplike organs of locomotion can be cultured out of a strain, which then becomes "naked." By another method, you can restore the lost organs, with which the germs have "strikingly increased penetrative power." He asserts further:

"There are great numbers of these changes in such lower micro-organisms. Two strains—Yasuda and Tadano—show rare change. The forms of these two kinds of bacilli grown on ordinary nutrient agar plates are generally short rodlike, devoid of capsules and spores, highly motile, and equipped with 8-10 flagella ("locomotive whips"). The colony is drop-like, round, and translucent. But transplant these forms on to dextrose agar media and the form of colony changes suddenly, and the round S colony becomes uneven, rough, grape bunch-like. The bacillus becomes several times or 'several ten times' as long and broad as the original form, and forming long threads of chain. The period of survival on nutrient agar at room temperature, heat resistance, virulence are all

inferior to those of the original form.”

The original forms are available at present only in Tokyo Imperial University, unless they are being distributed by Japanese elsewhere. Mention is made of increasing virulence and of new tests for virulence, but only the bare mention, without any details, is not a military secret. In every instance, you will find that the Japanese pays attention to virulence—quite remarkable attention.

Perhaps these newly invented types are not virulent enough for warfare. The Japanese can succeed where Pasteur and every non-Japanese worker since Pasteur has failed. Through the past half century, hundreds of the world's outstanding technicians have attempted the laboratory culture of the virus of rabies. The great Hideyo Noguchi made a “contribution to the cultivation of the parasite of rabies” in 1913, but complete success eluded him. In 1922 Imamura of Tokyo claimed success, but non-Japanese workers could not repeat the cultivation in glassware, as described by the Japanese. Still, the Japanese persisted with gruesome diligence in the development of new technics, and fourteen years later, in 1936, Kanazawa announced:

“You can cultivate in successive series, indefinitely, the virus of rabies—very simply, in a medium composed of brain tissue of embryonic rabbit. In this medium, the true multiplication of the virus has been incontestably demonstrated.”

A favorite Japanese theory is that rabies virus can be gotten into the human brain most efficiently and with the greatest speed if froth or spray containing the virus is “accidentally” wafted into the eye. As American technicians have

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proved, you can keep rabies virus alive and highly virulent for months if you coat the molecules with glycerine. No mad dog (other than a Japanese amok) is needed for use of such a preparation in mass transmission.

XIV

Miyagawa Cocktail

IN his last desperation, the Divine Emperor of Japan turns to Miyagawa, whom the emperor visits in a bomb-proof, germ-proof cubicle of the Government Institute for Infectious Diseases, Tokyo Imperial University.

"Secret Premier Miyagawa," the emperor tells the new war lord, "rumors of your unfortunate death are being spread. But I know that you will remain very much alive, however many scores of millions die mysterious deaths. Japan's destiny is in your sublimely skillful fingers."

"Divine Emperor, the rising sun of Japan is approaching the zenith, to bring fever heat to all non-Japanese, who are already caught in a secret net of viruses, rickettsia, bacteria, perfect fungi, spirochetes, Leishman-Donovan bodies, amebas, trypanosomes, and needle-worms. The noisy 'victories' of the United Nations are but pretty fireworks blinding the enemy to our silent infiltration with oligodynamic secret weapons."

"Non-Japanese populations are already permeated with the oligodynamic Miyagawa cocktail. Saturation, I understand, will give them all the pleasure of sweet lethe and escape from the horrors of this world."

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"Their ancestors will be so happy to greet so many newcomers. But we must act even more speedily. The United Nations are forcing the great German totalitarian state into oligodynamic warfare, and the Nazis are already plotting how best to start it, following Japan."

"Your reference?"

"Many references. A most impressive statement is that of Churchill's confidant, Lord Cherwell, so-called spokesman for the scientists of the United Nations. On April 18, 1944, he told the House of Lords:

'That strange and very formidable compound of docility and ferocity which makes up the German mentality has brought disaster on the world twice in one generation. The Government will take every step, however inconvenient, to prevent a recurrence, and no tenderness for the enemy or the troubles that it might involve for him will be allowed to stand in the way. There will be inter-Allied control of the German heavy iron and steel industries and manufactures as aviation, machine tools, and synthetic petrol and rubber. The backbone of both Germany's world wars has been the German chemical industry, which made all the explosives, and my simple proposal, is that she shall make no more explosives of any sort.' "

"Simply stated. Explosives make a lot of noise and interfere with wish to drowse. The ear is more sensitive than the eye, as propoganda proves. And did Churchill's friend mention oligodynamic warfare?"

"Of course not. United Nations militarists are utterly ignorant of the significance of little things. Because Japanese

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are smaller than many non-Japanese, militarists assume that the brain is too small for world domination. Because the United Nations militarists cannot see a germ or hear it, they consider it insignificant — however many times as many casualties the silent little thing causes as do all other weapons. But noise is fun or terrifying, according to the child. The maximum that Churchill's friend proposes, to make World War III impossible, is that:

'Any scheme of disarmament which fails to prevent the manufacture of explosives in Germany will begin as another farce and end in another tragedy.' "

"But how do you know that the United Nations have not considered disease warfare? What about Surgeon General Parran's accusation?"

"Accusation a vast understatement, as you have seen. No, the United Nations speak of preventing World War III."

"And?"

"And there can, of course, be no third world war. If any significant number of non-Japanese are left to plan a war, they would not dare start another with oligodynamic weapons. As they will have seen proved before or in their eyes, the world effects are unimaginably horrible. None would dare oligodynamic warfare a second time, and therefore no war would ever again result. The Japanese have solved the age-old problem of preventing war. At last we march ahead of Germany, also doomed with all non-Japanese, save enough slaves."

"The Miyagawa cocktail brings mass death to non-Japanese but world domination to Japanese. Have you new

formulas for the stupefyingly magnificent Miyagawa cocktail?"

"A formula for every taste, each formula basically similar to all others but some more peppery and quicker acting than others. Consider the nature of disease warfare.

"Disease is the secret weapon above all other secret weapons. Who can learn in advance the precise variety of weapon that you have picked to do your slaughtering? Theoretically, you can slay many, many hundreds of thousands before the enemy can start the lengthy researches required for the development of countermeasures. So, disease is a weapon unique in the magnitude of its threat. War has at last gone all the way to hell. But war was always very bad, and Japanese brilliance now makes war impossible through mere extension—along Nature's ways—of the new total war against a whole people, manpower, womanpower, childpower.

"You have an apparently infinite variety of germs and disease-causing chemicals from which to choose. Old germs can be modified to order. You can step up virulence to peaks of beautiful horror. You can shift the oldfashioned typhus rickettsia so as to fool and kill the enemy 'protected' by miracle vaccines, as the Nazis thought they were when they went into Poland and Russia, there to meet and die from unexpectedly virulent strains of rickettsia.

"You can discover in your country germs naturally occurring nowhere else on this planet. Consider the spread of plague, Ohara's disease, Japanese encephalitis, granuloma fungus, and slime fever into the western United States, of course by Providence aiding our Divine Emperor.

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"You can breed and invent new germs, never before seen. You can make chemicals that will cause disease in ways quite unexpected by the enemy, who may become cancerous or suddenly become senile. Soon you will see disease warfare waged by a small number of guerillas, paratroopers, 'tourists,' and even 'prisoners.' Ah, disease warfare is guerilla warfare super-expanded to total war without any weapons save invisible oligodynamic weapons.

"With air power, the Japanese could annihilate 95 per cent of the population of the Americas within two weeks, and the continents would be part of the Greater Japanese Empire within the month."

"But the enemy could create similar havoc in Nippon?"

"To be sure. But he is asleep. War must be humane, he says. Nevertheless, Japan cannot risk disastrous reprisal now. Japan must continue secret warfare with oligodynamic malaria, kala-azar, spirochetes, and other diseases as circumstances and the drowsiness of the enemy permit. The enemy does not really take such warfare seriously, despite the mysterious rise of disease to the rank of Casualty Causer No. 1 in this so-called 'scientific' war. Only a few years ago, he was boasting about the conquest of disease — even in war. Now he is wondering. But Japan must keep him wondering, never let him catch our agents at their secret work. But such agents he does not even look for. And his casualties from ancient diseases soar. So I announce proudly the indubitably magnificent Miyagawa Cocktail, Mark I."

"Mark I Miyagawa cocktail is the present concoction?"

"Is it not working?"

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"Beyond your own previous optimistic forecasts. But how can you put malaria animalcules into a cocktail?"

"Sometimes you must merely help the enemy to add a final dash of this or that, just to touch the whole business up—or off."

"Efficient! The enemy works for you! Highly efficient!"

"Mark I Miyagawa Cocktail complicated. But essentially the bases are high percentages of germs already abounding in non-Japanese human protoplasm—kala-azar, plague (but most furtively, and best not in America, where eyes may be knocked open), some cholera, new bacillary dysentery (where old not conquered), a touch of leprosy (for future effect), common colds (virulent strains)—"

"Amazing! Common colds! Very efficient at times?"

"To be sure. Much neglected advance invasion for other virus attacks—virus pneumonia, influenza, encephalitis of man and dog and horse and pig and cat and domestic fowls—all reservoirs. Very efficient! No significant research. Research skipped. No doctors, technicians."

"And you have not forgotten Shiga's dysentery bacillus?"

"Sulfa-drug resistant, penicillin resistant, and a highly virulent new strain. And dysentery amebas, already present in millions of Allied intestines, will be subtly replaced by ever so slightly more virulent types."

"All the common diseases? Is there not risk that the enemy will one year remark their increase and do something drastic?"

"Not until doomsday. Then it will be too late. Tuberculosis deaths increase in the greatest city of civilization,

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New York City, during 1943 and 1944. And the public is told: Number of tuberculosis cases now less than expected by health authorities, and tuberculosis has been reduced to the rank of Mere Killer No. 10. Meanwhile, the death rate from tuberculosis in New York City rises 4 per cent. New Yorkers too busy killing hundred Japs to bother about ten thousand deaths from insignificant little microbe. 120,000 Americans deferred from draft because of little germ—one type only. Thirteen active tuberculosis carriers in every 1,000 apparently healthy industrial workers. So Japanese oligodynamic technicians aided by enemy in scattering casualty-causing and death-bringing TB germs. Americans too interested popping off big noise. So who would bother if 2, 3, even 10 out of every Americans return home with TB? Would say: TB, why that's old stuff! Don't they have miracle drugs or something? TB good old standby."

"Why not 30 per cent infection with TB germ?"

"Too many. Might cause somebody do something before 1950. A little infection here, a little percentage of something else there—all add up."

"Maybe 30 to 40 per cent?"

"Why stop there? Miyagawa Cocktail Mark II waiting. For 90 per cent invaders."

"Invaders of Empire?"

"Of the island of Nippon! Quit before bombs drop. Then win. Diseases pop out right and left, but mainly behind."

"But won't they be suspicious? 90 per cent is high for first home-made cocktail."

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"Oh, not all at once. Within a year, maybe two. Take time. Nothing alarming about slow death. Besides, enemy has prepared public for new influx of so-called rare, tropical diseases never studied in America though there all along. Even pandemics inside Japan would not stimulate alarm—only to be expected under circumstances. Just wait, everybody will be told; miracle drugs are on way. Japanese even can help, maybe cure thousands. Regain good face. Get about after war. Tourists, ambassadors, and Japanese friendly scientists go everywhere."

"But if they expect these diseases to strike down many, why don't they do something big about it?"

"Like to dream while reading about miracles. Oh, they do some research, but almost 100 per cent resigned to ill-winds of Providence that blow insignificant germs. So research amounts practically to nothing. Oligodynamic agents kill scores of millions now, including Americans. Only Japanese care. Miyagawa so sorry."

"Mark III cocktail, for postwar years?"

"When Japanese tourists and ambassadors and so friendly Japanese scientists go everywhere. Through years spread basic ingredients. Then on A-D Day, really open up."

"A-D Day?"

"Allied Doomsday. One thousand different oligodynamic secret weapons of Miyagawa Cocktail Mark III put suddenly in use by re-educated, benevolent Japanese. Spread better than Ohara's disease, which was mere test."

"A long range view. A world view. Japan's sun is rising now!"

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"But suppose some American discovers panacea?"

"Panacea true miracle. Too much trouble for even Japanese to hunt."

"Ah, Miyagawa, your scientists have never hunted cures. Too busy?"

"So sorry, so busy. But we have our secrets. Many little remedies kept at home. Never publish. Military secrets."

"Much ado about cancer in Mark III?"

"Why not? Japanese natural. World expects Japanese pioneer in cancer-causing chemicals, aided by U. S. National Cancer Institute even in wartime. Many military secrets for new secret war gas weapons. Americans told: Expect more cancer cases every year. Cancer only kill a few thousand a day in Americas, more tomorrow. So, cancer-causing chemicals everywhere tomorrow, expected results follow."

"In all Japanese products?"

"That too risky. Many simpler methods broadcasting."

"But science analysts like Waldemar Kaempffert in New York Times keep repeating: Cancer problem could be solved within five years if research were made big business, one hundred thousandth as big as business for war that kills one-tenth of one per cent as many as does cancer."

"Who cares? Americans too busy killing few thousand Japs—"

"Few hundreds of thousands of Japanese, Hon. Miyagawa."

"Too busy anyway to bother about few million American deaths in the meantime. Only expected by those with American sleeping sickness. Japanese call such sickness Western

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Amok, or nocuous desuetude."

"You will spread cancer, Miyagawa?"

"After perfection Mark III Miyagawa Cocktail. Ready any time now. Plenty of time, though."

"Premier Miyagawa, your stature looms as big as that of Noguchi."

"Hon. Emperor, bigger. Noguchi repeatedly making mistakes. Ha, ha!"

"And Miyagawa makes no mistakes! Banzai!"

Interesting transmission and new thought about long known germs have been the boast of the 7th Research Department, Government Institute for Infectious Diseases, Tokyo Imperial University. These researches were conducted by order of Professor-Doctor Shuzo Sato, under the benevolent direction of Miyagawa. During 1936 and 1937, Ken Yanagisawa was engaged in studies of chemicals that reduce the virulence of tuberculosis rodlets. Suddenly, in 1938, Sato had a new idea; probably Yanagisawa was heading in the wrong direction. Sato put Yoji Oobayashi and Masao Takano to work with Yanagisawa, on the problem of increasing instead of decreasing the virulence of tuberculosis germs. This team reported great successes in 1940 with a variety of chemical agents. Because of malnutrition and crowding, as well as lack of medical attention, tuberculosis spreads more rapidly in wartime than in peacetime. Why not learn how to promote its spread in wartime by artificial means? Yanagisawa and his co-workers explain that thus you can learn more about tuberculosis control. The Japanese perceive possibilities usually missed by less dex-

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trous disseminators of culture. And they are “so sorry” to see tuberculosis—in uncrowded and wellfed Americans—suddenly begin to kill more enemies of Japan. If the Japanese are not to blame for this sudden rise in tuberculosis mortality, who is?

And who is to blame for the rise of cancer to the rank of Mass Killer No. 2—in America? Cancer is preventable. And the causes and cure could be discovered in less time than the Allies took to win World War I, when only 20,000,000 died deaths less horrible than those effected by oligodynamic cancer.

XV

Amok

MILLIONS of natives in the Far East, particularly in the Philippines, the Dutch East Indies, and Malaya, will not be at all surprised when the Japanese, impelled by self-induced homicidal mania, rush out into the open to deal death madly with previously secret weapons of oligodynamic warfare—even if the frenzy is obviously suicidal.

American psychiatrists as well as Far Eastern natives are familiar with the stereotyped, self-induced mental and physical outburst known as amok—a mania not only deliberately built up by the individual who runs amok but also fully expected by the neighbors watching. The Japanese collectively have offered every pre-indication and symptom of amok. Consider the Moro who runs amok in the Philippines—as he commonly used to do a generation ago, to kill Americans.

The future maniac in the beginning is a quite normal person, though given to brooding over fancied injury and out of a sense of inferiority excited by the sight of Americans who are much better off in many obvious ways. Hate flares up. The Moro visits a native priest, who seizes the opportunity for exhortation—and who has been known to be at

Amok

the bottom of the whole ugly business. The priest cunningly inflames the Moro, who is made to repeat ceaselessly: "There is no God but Allah!" The Moro goes about muttering to himself and the neighbors become alert. They suspect what is coming. The Moro spends much time in profound meditation before his idols. Secretly he prepares a deadly weapon, such as a cunning knife. Feeling keyed up almost to the desired point, he pays a final visit to his priest. The neighbors stand by.

The Moro returns to his home, a glow in his eyes, now like those of a mad dog. For a time he is overly calm. Then, all of a sudden, he seizes his secret weapon and dashes out of his hut. His good neighbors race for their lives, and wildly shriek:

"Amok, amok!"

Overwhelmed by self-stimulated blood lust, the Moro rushes about with amazing speed and, wielding his weapon with incredible skill and lethal power, within a matter of seconds has stabbed several Americans to death. If some one has time to bring to bear a counter-weapon, such as pistol, the Moro runs amok suicidally straight toward the muzzle. If all potential victims manage to hide, the Moro's blood lust is visited upon himself, and he cuts himself to ribbons as he rolls in frothing frenzy in the dust or mud.

In Japan, the people are told: "There is no God but the Emperor" and "The Americans stand in the way of your divine destiny." And they are taught to hypnotize themselves by the ritual of repeating these words and by visualizing a world-controlling future. They attack suddenly and

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with intense blood lust at Pearl Harbor. They fiendishly batter American children, women and men captured in the Philippines. Baffled on Attu, they turn their blood lust upon themselves, and gleefully commit mass suicide. In surrounded bomb-proof shelters throughout the southern Pacific, they blow their own chests away with grenades.

In the final death grapple of nations, they loose the thunderbolts of the gods—not necessarily in hope of suicide but just out of sheer stereotyped, self-induced blood lust. This lust is vastly the greater for its sight of countless victims—Americans flabby from “American sleeping sickness.”

XVI

American Sleeping Sickness

SLEEPINESS at Pearl Harbor is only one indication of that almost universal malady, "American sleeping sickness." The malaria experts were asleep in the Philippines and did not know what the enemy knew about hill-stream breeding malaria-carrying mosquitoes. The epidemiologists have not yet discovered how to make American troops alert to the menace of malaria—several times more effective than all other enemy action in putting men out of the fighting, and in 1944.

In Washington, someone forgot to pile up stocks of quinine and neglected to visualize the generations of casualties that must inevitably follow failure to provide new sources of quinine—should the Japanese take the Dutch East Indies, as they did. American physicians have been officially asked not to prescribe precious quinine, "even for malaria in the U. S." In early 1944, officials conveniently "forgot" all about three million or four million cases of malaria already uncontrolled in this country and talked in their dreams about "possible small outbreaks taking care of themselves." Even the airports in malarious regions are allowed to remain sources of infection of returning personnel.

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Washington officials sleepily warn doctors about the incoming cases of malaria, bacillary dysentery, amebic dysentery, filariasis, kala-azar, schistosomiasis (flatworm diseases), African trypanosomiasis, leprosy, relapsing fever, and "various fungus diseases of the skin," as noted in JAMA, December 18, 1943; this official statement was mentioned on page 154. With millions of cases of malaria already in the United States, this amazing document points out:

"It is possible that local outbreaks of malaria may occur in this country, starting from relapsing cases acquired abroad. The United States Public Health Service recognizes this possibility and is prepared to act vigorously if epidemics occur!"

Also, "physicians can cooperate in avoiding such occurrences by the early diagnosis and reporting of cases, by adequate treatment, and by preventing access of mosquitoes to infected patients."

In the first place, diagnosis is difficult. That is one great reason why malaria is so valuable a secret weapon. Malaria may simulate any of a score of diseases. Next, there is no adequate treatment. Even quinine is only 50 per cent effective. On March 29, 1944, Lieut. Cmdr. Garrett Duryea, of the Naval Medical Corps, told a meeting of physicians at the New York Academy of Medicine:

"The treatments so far devised for malaria are unsatisfactory. A so-called '90 day cure' has recently been tried out in Honolulu. After being returned to the south Pacific, men so treated had recurring cases." Recurring cases are not the result of *new* infection.

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Just how civilian doctors are expected to prevent the access of mosquitoes to millions of infected patients is a problem wisely ignored.

In the face of all these threats, what is the overburdened physician to do? "Physicians can cooperate by providing themselves with a modern textbook on tropical medicine, by keeping these diseases in mind, and by reporting them to public health authorities as soon as a diagnosis is made."

A modern textbook on tropical medicine should run to about 1700 or 2000 pages. It is not light reading, however fascinating. Just the reading and not the study of it would take the most brilliant general practitioner several weeks, full time, without any attention to patients—who may be coming in with malaria before the doctor gets to that chapter and who may be dead before he finds out how to make a tentative diagnosis.

As for dysentery: "bacillary dysentery is usually an acute disease but may become chronic or give rise to carriers." By definition, a carrier is one without obvious symptoms. And "transient or chronic carriers of dysentery bacilli are usually present among the contacts of cases." Sulfa drug treatment is recommended "in order to avoid the development of active symptoms or further spread of the infection." It seems as though government experts are themselves beginning to believe all they tell the public about "miracle drugs." Dysentery bacilli are often resistant to sulfa drugs. Amebic dysentery is an even greater problem. "It is much more likely to become chronic or to recur. The incubation period may be very long, or infections acquired in the

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tropics may produce no symptoms in the initial patient but may be responsible for family or community epidemics. This condition should be suspected in any person returned from the tropics who complains of blood in the stools, alternating diarrhea and constipation or even vague abdominal symptoms." Wow! And the doctor cannot himself make the diagnosis:

"Diagnosis must be made by a technician competent to differentiate the ameba from other intestinal protozoa and from body cells."

When the studious physician gets to page 500 or so of his "Tropical Diseases," he will be unpleasantly surprised to find out that today amebic dysentery, like malaria, is "an important disease in the southern states." Further, today "it is not rare in the northern states." In World War I, the great expert Kofoed examined 1,200 American soldiers returning in apparent health, not from the tropics but from France. Eleven per cent of these "healthy" soldiers had the parasites without the symptoms. They were carriers. In a 1939 survey of Navy recruits from the southern states, 15 per cent were found to be carriers of amebic dysentery; northern recruits were 8 per cent infected—before heading for the tropics! In fact, the best estimates of present infection today—throughout the 135,000,000 people of this country—run between 5 and 10 per cent of the population. Between 6,250,000 and 13,500,000 people already are infected with this so-called tropical disease. Of course, as the National Research Council hopefully indicates:

"Possibly strains of the dysentery ameba from the tropics

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are more pathogenic than those from temperate zones."

Reading on, the physician finds that even in the most modern army camps, ordinary houseflies start epidemics of the more virulent strains of amebas. Diagnosis is possible only for the most expert technicians—of which there are, at the most, only a few hundred in the entire United States. In outbreaks of the severer forms of the disease, only 10 victims out of a hundred will die, if treatment is optimal.

Well may the physician wonder what would happen if the Japanese choose to scatter parasitic amebas for contamination of water supplies and for general infection with more virulent strains among men, dogs, and rats. He may even wonder if the Japanese have not done so already—Americans with sleeping sickness being none the wiser. At least, some secret agents have already done a good job for the enemy. Chlorination does not kill the amebic cysts (resistant forms) in water. Filtering helps, but only boiling is sure. According to Admiral Stitt and Col. Strong, epidemics of the virulent strains are to be expected: of course without promotion by the enemy. Possible promotion by the enemy is forgotten.

Your conscientious doctor learns that filariasis is not merely a tropical disease and today has insignificant spotty distribution in some southern areas. But it is carried by the common night-biting mosquitoes. In World War II, as government reports indicate, "cases of this threadworm infection have been acquired by military personnel, and in the absence of an effective chemotherapeutic agent (miracle drug) infected individuals may be discharged from military service and have subsequent attacks . . . after several months

or years." "The possibility of the establishment of endemic foci (enduringly infected populations) must be kept in mind, but this is improbable." "There is no specific treatment for the worm." "Diagnosis is exceedingly difficult, even for specialists."

Schistosomiasis, caused by tropical flatworms, is difficult to diagnose. In some countries, it causes more sickness and death than any other single disease. In Egypt, three out of four have it. In Venezuela, practically everybody has it. In vast areas in China, scores of millions are plagued by the worms, which get in their symptomless work for months or years before blood begins to pour from the kidneys, stones form, any or every organ begins to fail, as the patient wastes away. Some worms prefer the intestines and the liver to the kidneys, and cause other symptoms: irregular fever, great pain in the abdomen, rigors—as in a score of other diseases. There may be intestinal tumors, hemorrhoids, cirrhosis of the liver. The Japanese are afflicted by a variety of worm which causes Katayama disease, a chronic dysentery. Now tens of millions of Chinese have it, and the whole Yangtse valley is infected. Nobody knows whether or not it was deliberately spread. Dogs are excellent carriers. So are Japanese field mice. Why do the Japanese not control Katayama worms? Have the Japanese ever been interested in disease control, as are Americans when not suffering from American sleeping sickness? Perhaps the Japanese do control the disease. At any rate, they are not troubled by it to the extent that your allies the Chinese are, because without American drugs and doctors. Doctors are more important at present

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than even military "experts," especially those ignorant of the insignificance of their killings as compared to those of oligodynamic warfare.

Leprosy may spread. But until the Japanese deliberately broadcast more virulent leprosy bacilli, there will be millions of cases transmitting their neglected infection. Your doctor, though warned about the introduction of new cases of leprosy, would seem to have time to study this disease in later years. Patients generally do not die of it for years. Diagnosis must be left to experts, say the treatises on tropical diseases. Leprosy is still found in every climate. The Japanese may have discovered the secret of leprosy's earlier virulence, when the germs killed millions through centuries in Europe. Though nobody is doing anything important about leprosy, your conscientious doctor realizes that other diseases demand his immediate attention.

The spirochetes of relapsing fever, slime fever, sodoku, and yaws are fascinating if only because of their close kinship to syphilis spirals. They are also remarkable for the confusion which they cause in the minds of the foremost experts. Slime fever is generally termed infectious jaundice. But the same term is applied to what Palestine researchers as well as many American specialists believe to be a virus disease. In Palestine, within the two year period 1941-1943, more than 5,000 victims were caught by secret germs. Were these agents spirochetes or virus molecules? There is a debate on. Sometimes the infection in Palestine seems to spread like influenza, by droplets breathed in and out invisibly among crowds. In almost every war during the past

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150 years, spirochete-or-virus jaundice has been epidemic; World War II has been no exception. Dr. Douglas Symmers, General Director of Laboratories, New York City Department of Hospitals, recently wrote to the editor of JAMA:

“From experience at Bellevue Hospital I am led to the conclusion that there is a form of epidemic hemorrhagic jaundice in which the mortality is high (about 56 per cent) and there is no spirochetal infection. Virus infection cannot be denied and probably exists, and the disease belongs in the same group as the so-called acute catarrhal jaundice and the epidemic hepatitis [liver inflammation] observed in more recent years in army hospitals [in Germany].”

At this point in his studies, your conscientious doctor probably perceives that he must spend a life time in tracking down the mysteries of spirochete-or-virus “infectious jaundice” or slime fever or catarrhal jaundice or epidemic hepatitis so as ultimately to be able to follow the suggestions of the National Research Council and “report these diseases to the public health authorities as soon as a diagnosis is made.”

You can leave your doctor to his studies. There would seem to be no need to rush farther in where angels can't even stumble along. If at any time you want to return to your studious doctor, you can readily find him. He will be just where you left him—in confusion. He may hope that his plight is obvious and that help is on the way. But such hope would be false. American sleeping sickness is pandemic.

Considerable mention has been made of dogs as carriers. Dog lovers everywhere will be interested to know that veter-

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inarians have not even been advised to read up on "tropical" afflictions which will be transmitted to dogs by returning military personnel. Among these diseases are black fever, Oriental sore, slime fever, schistosomiasis, and "various fungus diseases" left to the imagination.

Never in all history have so many lethal agents been brought back to so many by so many. Uncountable oligodynamic killers are to be loosed all at once in every part of the nation. Probably each government specialist has thought through the problem of his own specific mass killer. Each oligodynamic killer alone may (or may not) seem controllable. But nobody has thought through the intertwined problems of combinations of outlandish, highly virulent mass slaughterers all let loose at once. Of course the excuse is that this is the age of specialization. The truth is that nobody can think through such shadowy complexities of mingled menaces. No mind or group of minds can do more or less toward ultimate national security than to prepare for the very worst. Instead of promoting the vast development of medical education, medical and veterinary research, and general preparations for oligodynamic warring, politicians flood the population with additional soothing syrup and so deepen the sickness of this continental somnambulism in the shadow of looming galaxies of the world's greatest killers.

You would expect that, because the shortage of good doctors and medical researchers is already acute, more doctors would be trained and more technicians provided. You would expect that facts would soon be on the way to replace

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lethal ignorance and medical confusion about oligodynamic weapons of Nature and the Japanese. Such facts can be gained only by cooperation of many more medical researchers than you now have working for your very life and that of the whole nation.

What promises to be the most tragic story in American history broke in the alert New York Times on March 30, 1944. Under the by-line of Benjamin Fine, the Times pointed out that, as a result of new government regulations, medical schools of the United States would suffer a staggering reduction in the number of students scheduled to enter in 1945. A warning was issued by Dr. Willard C. Rappleye, dean of Columbia University's College of Physicians and Surgeons and chairman of the executive council, Association of American Medical Colleges:

"Despite the urgent need for doctors now and in the post-war period, there will be a substantial reduction in the number of medical students during the next few years. A serious shortage of doctors will result."

The air you breathe at this moment is swarming with germs—kept fitfully at bay only by progressive efforts of thousands of medical scientists, including practicing doctors and medical researchers. Without living until pestilences are loosed in oligodynamic warfare, millions die young today—in spite of the "success" of public health authorities and the advent of "miracle drugs."

Although the Surgeon General has warned that the enemy plans to use germ warfare wherever possible and although the enemy is using such oligodynamic secret weapons de-

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fensively if not offensively at this very instant, somnambulant officials cut the aid promised previously to already overburdened civilian doctors. With not enough doctors to go around now, it would seem necessary as a measure of immediate expediency to pull the relatively few research doctors away from their attempts to clear some of the confusion concerning cause, diagnosis, treatment, and prevention of the plagues already uncontrolled.

Today doctors do not have time to read about the possible measures against the outlandish, virulent mass killers now being imported by returning military personnel. What are they going to do tomorrow? Apparently the Japanese do not have to bother to loose the thunderbolts of the gods.

While you read about the "successes" of "modern" medical science and the mass production of miracle drugs, not only the Chinese armies are suffering hundreds of thousands of casualties from epidemics, but even your own troops are being infected by malaria and other, more mysterious diseases—which cause all other enemy action to pale into practical insignificance. The Chinese armies lack medical supplies and doctors. American forces have not enough experts to protect them from epidemics as they could be protected. The civilian population is allowed to march down the valleys of death-by-preventable-disease. American sleeping sickness will be the cause of the infection of generations unborn.

It is tragic that mosquitoes, sandflies, fleas, lice, and bedbugs cannot bite through brass hats or cause pruritis (itching) of political ivory. Otherwise there would be more head

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scratching and wonderment about what is to be done.

It is fantastically the truth that a casualty does not appear to be important unless there is some noise connected with the cause. The secret weapon of the Japanese and the great wings of death are inaudible. The almost universal affliction, American sleeping sickness, has an obvious symptom which permits ready diagnosis: The victim is roused by noises but not by the darkest shadows immediately before his eyes. And the victim talks in his sleep, thus giving away military secrets—the number of casualties from oligodynamic warfare and the new discoveries concerning the most powerful secret weapons.

XVII

Biocracy

WAR waged by means of the oldfashioned non-oligodynamic weapons kills its millions only. Oligodynamic warfare, the new jiu-jitsu in the death grapple of nations, kills its tens of millions. But oligodynamic warfare merely is a promotion of the peacetime and wartime activities of natural agents which eventually annihilate every generation.

Legally, it is already recognized that, as Seneca said in 50 A.D., "Men do not die; they kill themselves." In the United States, at last it is illegal to write "senescence" (old-aging) as the cause of death indicated on the death certificate. So men give up their breath to accident or disease.

American scientists have at last rejuvenated the oldest scientific conception: Human life can be prolonged indefinitely and the importance of such an enterprise is second only to that of religious endeavors. So wrote the Wise Men of Sumer in Mesopotamia 6,500 years ago. The wedge-shaped or cuneiform writing of the Wise Men is the oldest recorded wisdom, as you can discover for yourself by reference to the Encyclopedia Britannica. As I have pointed out in my recent book, "Must We Grow Old?," the gerontologists — scientists against death by so-called "aging" — have

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come to the new-old conclusion: "Our philosophy need no longer anchor us to the concept of a fixed span of life" (in the words of Dr. Clive M. McCay, who can stretch the life spans of the rats in your basement) .

So you are to die unnecessarily, if not by preventable heart disease then by cancer (Mass Killer No. 2, as of 1944) or some other preventable disease. And you as a world citizen commit murder-by-omission. Not only do you permit malaria and several other controllable germ diseases to catch millions of American victims, but also you let Nature take its course along the road to mass killing in every continent and on all islands, including those of the Philippines—where Bataan so early fell on account of air power, the wings of anopheles aiding the less deadly man-made Japanese wings.

If you continue long to skip the ugly thought of mass murder-by-stupidity and mass murder-by-laziness, you will continue to walk with your so "dearly beloved" ones and your good neighbors in the shadow of death looming all the huger and the darker because of the smoke-screens put forth to cover pocketbooks and negligence. You and your nation are not prepared for oligodynamic warfare, waged by Japanese or by vastly more powerful, menacing Nature.

If you ever learn the first lesson of minds eager to survive—"Complacency today, Death tomorrow!"—then you may bestir yourself and set about promoting a world march up the road to life, on past the valleys of the shadows of needless deaths by disease.

Either you are quite willing to let the tens of millions and the hundreds of millions die young because of oligody-

namic warfare, or you are not. If you are not willing to participate in mass murder-by-omission, then you have work to do — work costly, revolutionary, and eventually most profitable financially as well as psychically. Warfare against disease pays off. You can do a lot to help keep your children alive so that they can work for you later, and you may derive some psychic income too from such efforts. You can help keep your good neighbors as well as your employees free of disease. General prosperity is thus promoted. You may even have sense enough to perceive that your neglect of public health and world health problems is what keeps your own chances of long survival so low as they are today. Postwar epidemics—loosed secretly by Japanese or other agents of malevolent Nature—can take you off too. Why do you think that you are going to be one of the few lucky ones when the world epidemics sweep around you?

Already you have helped to reduce your own chances of long survival. Who in a democracy elects men with sleeping sickness to office? Who in a democracy votes for educational executives ignorant of the very first lesson taught by the oncoming shadows of Nature? Today every germ-diseased person in the world is a menace to you. And yet you let entire continents remain so infected that an international hospital with a billion beds would not be enough to accommodate all the patients who should be treated there. According to an estimate published in a recent number of the U. S. Naval Medical Bulletin, in India *alone* there are at least 100,000,000 cases of malaria *alone*. Right there you have one-twentieth of your world population. In the United

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States—don't forget—because of almost 135,000,000 cases of "American sleeping sickness" you find between three million and four million children, women, and men infected with malarial parasites, which therefore have already caught more than 2 per cent of the total population. More virulent parasites are in and more are on the way. The population of Africa is some 160,000,000—and approximately 150,000,000 of these are living museums of viruses, rickettsia germs, pathological fungi, flesh-eating animalcules, spirochetes, worms, liver flukes, black fever protozoans, leprosy bacilli, brain-devouring trypanosomes — not to mention scores of species of other equally murderous natural agents. You'll be very, very lucky if some one or a dozen of these germs does not invade your complacent, semi-conscious body.

Probably you are dreaming that the war is all but over. The casualties of World War II have scarcely yet begun to show up. World War II and oligodynamic warfare will be killing thousands heaped upon the bodies of thousands—for generations—unless you are going to do something big about it all.

Before you begin to consider what must be done to war intelligently on oligodynamic agents, you would do well to get clearly in mind just how close to death you are now. Did you ever hear of any one who never had a cold in all his life or is definitely immune to cold, logically called common? You know how colds sweep through entire communities. The prime cause of such an epidemic is a virus, whose virulence varies as it leaps by invisible droplets from breath to breath. The virus molecules are the shock troops,

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weakening the bodies of men for secondary invasion—by bacteria or other viruses such as those of influenza, one of the great killers of all time (20,000,000 deaths during the six months just at the end of World War I). Suppose the Japanese loosed “hopped up” viruses of the common cold. What then? Many technicians know how to step up the virulence of any virus. Do you know anything that is good for a cold, whether incapacitating or lethal? Why not? Simply because you have not adequately promoted medical research. Do you recall the nationwide epidemic of virus pneumonia which excited general alarm during 1942-43? Miracle drugs there are against pneumonia *bacteria* but not against pneumonia virus(es). Was this epidemic the outcome of preliminary Japanese efforts to wage some jiu-jitsu warfare by means of “ordinary” cold virus—“hopped up”? Who knows? At any rate, only sheer luck—luck *alone*—saved thousands of American lives, military and civilian. Up-to-the-minute medical science was utterly baffled. Such bafflement is caused by ignorance, which can readily be removed by research—and will be, as Americans start the revolutionary march up the road to life, toward sentient, sensitive, sensible *biocracy*, and up the surest way to enduring peace.

Even when the universal march begins, as one day it must begin, don't forget that you will still be doomed to early death by preventable disease, just as you are today. What do you think you are going to die of? The doctor beside your deathbed cannot legally list your death as caused by the ghost of a non-existent phenomenon, the dead fiction—“senescence.” If you want to keep breathing a little longer,

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all you have to do is to get together with your friends and put up what it takes—cash and labor and facilities for better American medical science. And when Yank researchers really get interested, they have no peers. Researching is pioneering on the new frontiers of America. These frontiers lie well beyond international boundaries and in the wondrous zones between the shores of life and the abyss of death. The ruggedest pioneers have been Americans.

You must sacrifice for peace as well as for war. Why not? The preventable mass deaths of peace are vastly greater in number (day by day) than deaths in the bloodiest warring. The mass deaths of peace are attributable not only to failure to make supreme application of present knowledge of life-saving but also to neglect of the probabilities of medical research. Oligodynamic warfare is potentially the bloodiest of all types of totalitarian killing—but is so only because of ignorance that could be removed by research and other practical medical preparations.

To see the woods in spite of the trees, to perceive the obvious mass deaths (mass murders-by-omission) of peacetime, to become fervent in their prevention, to be life-minded in the wartime and the postwar world—thus we may become one world of, and for life—not a world of mass murder and preventable mass death.

So far, the American way has not really been the way of life. It has led through many a valley of death, where we have witnessed the needless loss of life through neglect of the poor and the lack of optimal medical care for the majority of our people and through the neglect of vital discoveries

to be made only a short distance up the road to life. Like the Axis populations, have we not too been driven far down the road to death by that insane instinct Freud saw to be basic within us—the *death instinct*, the morbid and almost irresistible urge for the ultimate escape from the struggle for existence?

Confronted by a Nature red in tooth and claw, you have chosen forgetfulness in minor pleasures and luxuries and have remained actually and thus morbidly half in love with easeful death. If you had been inspired to a life-minded mood years ago, not only would you have taken practical measures to insure your way of life but by the thrill of your very example—a surging drive, an amazing total effort—you would have disarmed your international enemies whose death mood would have been transmuted in the observation of an almost incredible practical national enterprise. For once in world history, there would be seen the march of a whole nation toward the tangible and intangible riches of a higher vital destiny. A world revolution may be more readily effected by the cold storage of plasma than by the spilling of blood. You cannot get a healthy, comfortable and soulfully progressive nation to start a war.

Except in the spasm of a war for freedom, the great masses of population have never had a great practical purpose — clearly practical — to inspire and coordinate their lives. It seems that the innate German and Japanese spirit hungers for some heroic aim to which the individual can devote himself, whatever the toil and suffering—a murderous nature when misdirected as during the past decades.

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This spirit must be reckoned with in planning a practical and enduring peace. The world's one perfectly humane pursuit, the science of human life, could meet this deficiency of mankind.

In war, a democracy becomes a totalitarian state. The thunder of continental toil follows the dawn of understanding. The free will of a hundred and thirty-five million surge up the same road, to freedom. The collective effort satisfies the ambition of the most rugged individualist. Freedom is more vital than vitality.

Yet the will to be free arises from healthy life in democratic peacetime. The healthier that living, the more powerful the will and its human frame. In peace, when freedom is once again assured, should not vital energy be increased and husbanded against another decade of consuming exertion—to meet the menace of Japanese and Germans amok with new *isms* buzzing in their ears and with oligodynamic secret weapons?

What is a democracy? It is a life system developed by the people who vote according to the mood created by intelligence and experience, including education. The greatest happiness of the greatest number emerges from the wisest design for living—the healthiest living. So, naturally, the democratic way of life is the road up to life. Scientists traveling this road discover the secrets with which to counter oligodynamic secret weapons of Nature and man. Practically by definition, a perfect democracy is a *biocracy*—government by and for life, sheer existence plus a cultured sentience. (In recent years, democracy has become more

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and more a life-minded totalitarian system — with social security promoted above many other designs for living. Perhaps almost blindly, the majority of democratic human beings are already beginning to stumble toward the road to life—optimal life.)

Life science against oligodynamic agents could be the source of enterprises so numerous and so thrillingly vital that a biocracy would be at once totalitarian and democratic—with opportunities, all life promoting, exciting the idiosyncrasies and ambitions of the ruggedest individualists however diverse.

A biocracy is what a democracy could be and should be but never has been. It is, however, a way of life that man—primitive man—followed, because he had to follow it in order to survive even briefly. To survive, early man applied all he knew, small science that it was. He won out in the struggle for existence, and his offspring were able to found civilization, whose sons and daughters generally became narcotized by a false sense of security even in the midst of numberless deadly perils all the more menacing because civilization means massing the millions for the mass killers. Most civilized nations forgot that man and woman must always fight tooth and nail for life. Many promising cultures coasted down the road to death.

In a modern biocracy, all science, especially the sciences of life and medicine, would be reasonably and efficiently applied to life's optimal development on our planet. A biocracy, in a sense, would be a return to the "natural" mode of life — the liveliest possible mode, as sensed by

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woman and man fighting for their very lives and those of their offspring. The main facts of life would be intelligently sought out, made universally obvious, and with the aid of common sense, would be turned into signposts pointing out the best road to life. Biocracy literally means *government for and by life*, presumably intelligent life.

In a biocracy, man and woman conspire to use all their inherent and acquired powers to increase to a maximum the chances of survival and the odds in favor of the happiest development of the species, individually and therefore collectively. The environment, inorganic and organic, oligodynamic agents, present and future, on into the distant future, would be analyzed. Difficulties and dangers would be clearly set forth, and countermeasures would be considered and the most scientifically promising selected. Common sense, making such scientific plans, would execute them, with the modifications indicated by experience in a changing environment.

There would be no violation of the principles of democracy. Rather their wisdom would be extended. In fact, broad education — carried on in a democracy as nowhere else — always promotes common sense and removes the fogs obscuring true vision of the basic realities of existence. Hence democracy already induces many biocratic thoughts and activities. In this country, education—such as it has been—has impelled you to move, though unconsciously, in the general direction of a national biocracy. Now the war is widening the scope of your planning. Eventually you may be able to attain a realistic view of the world and man and

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woman and destiny. Then you could not help taking practical steps.

Practical biocracy would mean the establishment of the "freedoms" mentioned nowadays—and of far more. It would mean the founding, the popularizing and the continuous improvement of a world philosophy and a world system for promoting life. Law would come to have clear, rational bases, readily demonstrable and reasonable to all. The endeavors of the new order and the best earthly suggestions of religion would harmonize. For they would be the same.

The first duty of man, says the Bible, is to prevent needless loss of life among his fellows. If this duty were performed with a will and with efficiency, and with regard to lives unborn, there would be time, effort, and money for little else. In performing man's first duty, you revolutionize society, make it alive and livable, hopeful, inspiring, and practical—it would pay off.

In this thoroughly enlightened democracy, the national biocracy, the power and the lofty aspirations would keep on being of the people—for the life (of the people) —with the democratic impetus set free to increase to its vital maximum. The present patterns of thought and action would be changed only to the extent necessary to take you up the road to life.

EDUCATION

The bedrock of biocracy is knowledge—the ordered facts from science, sought throughout life. Education in a biocracy begins in youth and continues until the mourners go about the sterets. By every practical means, young and old

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are enlightened about the drama of life—men against death. In a biocracy, first things come first. The child soon learns that man's place in nature is shaky. The youth begins early to see and absorb the simple yet everlastingly startling moving picture of man and woman struggling for survival, for health, for durable happiness. Life-long education in human life-science is indispensable to good citizenship.

Every citizen is a factor in developing a most humane culture. The child in a biocracy would begin a notebook on bioscientific philosophy. The increase of these notes would stop only at death. A continuous course in the simple philosophy of human bioscience should go on through primary school, through secondary school, through college, through systems of compulsory adult education. The compulsion never really ends, does it? Every one should know the main natural and unnatural threats to community, nation, race. None should be allowed to forget that, worse than the Japanese and vastly more menacing, Dame Nature is a hellion—who eventually kills every one of her young—and this murder even the Japanese do not commit.

You must help make clear the possibilities and the probabilities of medical science, so that preventive medicine, medical practice, and medical research will be vastly extended. Popular hope and imagination must be excited. The simple facts, with their main implications carefully interpreted, would induce the excitement and the motive force for great concerted action. The progress of the basic sciences too must be generally known. There must be universal understanding of the promise of exploration—through

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laboratory world, through telescope and spectroscope, down the depths and the bottoms of the seas, through the jungles of South America and Africa, down miles into the warmth, terrors, and untouched riches of the earth's inner crust, and up a score of miles above the earth. There should be a national daily newspaper of science.

Also throughout life, everybody should be required to study logical and critical analysis. Common misconceptions and prejudices would be the specimens to be examined in the mental laboratories.

The economics of life-saving and life-promoting endeavors must be generally understood. The cash value of a healthy life, the economic and social losses caused by disease, and the financial dangers of oligodynamic secret weapons, your educators should clarify. There are a myriad life-minded business enterprises that could be profitably undertaken in a capitalistic biocracy and that should be prime considerations for the life-minded educator.

For the advancement of the sciences, there would be needed large numbers of scientists and assistants, mathematicians, industrial technicians, engineers, laboratory and museum planners, librarians, literary researchers, abstracters, indexers, photographers, artists, editors, coordinators, supervisors, and special administrators—numbers large beyond present conceptions in a death-minded world.

For public health, preventive medicine, and extended medical practice, there would be needed public health experts, doctors, nurses, laboratory technicians. The number of teachers of the sciences would have to be multiplied.

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Scientific education must be provided for all this personnel to staff the central and subsidiary halls of the flames of human life, to form the armies against death by oligodynamic weapons of Nature and unnatural man, and to people the commercial life-enterprises.

Every biocratic citizen should learn well the methods of science and the efficient ways of going about solving problems, making discoveries, and establishing facts — all with regard to the promotion of vigor, longevity, and lofty sentience—to the advantage of self, family, community, nation, world.

VOTES FOR LIFE

A life-minded people, educated in the science of human life and made logically critical of demagoguery, would extend vital undertakings until democracy naturally reached its highest phase, biocracy. Except for mass-murderous demagogues, every one would benefit. Votes would select life-minded representatives and executives, familiar with the most vital problems and experienced in making the most efficient practical approaches to the solution of such problems.

LOCAL BOARDS OF HEALTH

Today, part of the work of many local boards of health is to hide the incidence of malaria and other diseases whose prevalence reflects upon the community, and general knowledge of which would hurt the community pocketbook. Ask any malariologist and he will tell you that many southern boards of health hide the incidence of malaria, just as prominent politicians do during election year.

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In a biocracy, votes in the many communities would gradually increase the significance and powers of the local boards of health. Eventually these boards would assume the primary functions of government. Save freedom for life, what is more important than human lives? The town hall must become the hall of life. Voters would attend board of health meetings. The law should require the attendance of school principals and teachers. Also, in an advisory and liaison capacity at these meetings should be representatives of the county, state, and national health services. In the event of the establishment of a world biocracy, foreign health experts would make a routine of consulting at these local meetings. Local businessmen would have their practical say. Could it be forgotten that attending representatives of labor organizations would be delegates from that portion of the population having the highest morbidity and mortality rates—particularly from preventable cancer of the stomach?

On the very smallest local board, should not research be represented? Research is practical hope and effort for tomorrow.

Periodically, at special meetings against each outstanding affliction a practicing expert and a researcher should simply explain the present phase of the war—against heart, blood vessel and kidney diseases, against cancer, against tuberculosis, against venereal diseases, against malaria and newly imported plagues, perhaps running wild because earlier neglected.

There is a gap in popular understanding of the most sig-

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nificant considerations. Else why should anti-cancer work, anti-tuberculosis work, be supported in haphazard and niggardly fashion, mainly through chance gifts and the sale of bits of paper? Why only dimes against infantile paralysis? Why nothing at all—not even pennies—against malaria in a dozen southern states? Why nothing at all against the greatest killers—cardiovascular-renal diseases?

Much money is wasted in the drives to raise money. Some anti-tuberculosis societies may spend one dollar to get two. In cooperation with educators of youth and of adult, public health authorities should be able to do away with the need for such extravagance.

The national life-promoting system must be integrated out of community systems for life. When the majority of families in each hamlet or town can be made familiar with the prime facts of life, only then can you begin to make democracy what it should be.

STATE BOARDS OF HEALTH

The size and functions of the state board of health should be increased until its powers equal its vital significance. Its members should include the state health department specialists in the various human afflictions, should include state bio-researchers on these maladies. Each county board of health and the U. S. Public Health Service should be represented on the state board. The state board should have an efficient committee on planning, short range and long range.

Each state should also have an advisory, consultant and critical group of approximately sixty experts. This group

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should be made up of a representative from each of the 47 other states, and outstanding specialists invited from abroad. Their sole work would be to analyze and criticize—with cool logic and with vital severity—the public health measures and medical progress of the state.

Educated, life-minded voters elect legislators and governors who actually know a little about the most pressing problems of life and needless death among their population. How many politicians today can tell you the incidence of even the most menacing disease in their own home towns?

POLITICAL PLATFORMS

In a true democracy, the political platforms would be conceived and developed in the light of the most brilliant and vitally significant life science. The competitive impetus could be given healthy guidance up the road to life—out of many possible vital platforms, that system of plans apparently the most invigorating to the most families should be the logical choice of the voters. Who ever heard of such a thing! But must ears continue to be deafened by soothing syrup which induces sleeping sickness?

CONGRESS

At least a few demagogues should be regularly elected—not only to provide comic relief but also to be studied as dynamic fossils, hangovers from the days down the valley of death.

In general, before the balloting should there not be some sort of civil service pre-requisites or examinations for candidates to office?

Today, you place literacy above vital considerations.

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Many a man whose signature is an "X" has ideas more important than those of a professor with an alphabet after his name.

A life-promoting idea or plan, as well as an outstanding bio-education or a record of practical mass life-saving on a statesmanlike scale, should fit a man for office—other factors of good citizenship being accounted for.

THE CABINET

In peacetime, the most important cabinet members should be the secretary of public health, the secretary of research, and the secretary of education—not political appointees like the Surgeon General, who must be tempted to pay off in lives the price of his office.

THE PRESIDENT

A life-minded people would select a president who realizes the inevitable menace of foreign powers that may be swept into total oligodynamic war by some plausible, towering personality. Such a president can also realize the strength of a free nation, realistically prepared against total war but otherwise making a total effort against needless deaths and for the promotion of maximum national vigor.

THE NATIONAL RESOURCES PLANNING CONGRESS

The National Resources Planning Congress would be made up of (1) a chairman selected by the president of the United States; (2) a senate of 100 likewise selected, from the foremost scientists (including educators and industrial experts) of the nation at large; (3) a house of representatives—scientists too—selected, on the basis of their records and platforms, by the voters of the separate states, the rep-

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resentation being according to population, as in the U. S. House of Representatives (whose members today cannot tell their constituents of any practical method of countering oligodynamic warfare of which the Surgeon General warned) ; and (4) a National Research Council of advisors and consultants—all selected by the chairman of the congress. The house should divide itself into committees devoted each to planning solutions to a great life problem, and the Council should aid in this creation of committees. The Council itself may point out problems, as well as basic plans, to the house. The senate should debate, modify, and select the plans, the Council providing new information as required.

The chairman transmits the national plans to the Congress of the United States, and makes recommendations with the aid of his staff. A special liaison group made up of members of the two congresses provides needed intercommunication. An important function of the scientific congress would be to criticize the work of the political congress and to publish these criticisms.

The main national resources are the vigorous brains of the nation. The planning congress would bring about enormous expansion of the National Institute of Health until it became the Life Center of the nation and the greatest enterprise of man and woman in history. In every town there should be a division—cooperating, in the local hall of life, with local life organizations. Academic and industrial bio-research would be promoted. Billions annually for this life work? Many billions.

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One day the congress may evolve a super-organization of the sciences—for the optimal promotion of life—employing in all its phases not just thousands of workers but millions. How many billions of dollars should you throw into the solving of the problems of cancer? Take a vote among those cancer patients who have a maximum life expectancy of three months to a year. Indeed, among young and old healthy biocratic democrats, would not the vote be approximately the same?

PEACE BEGINS AT HOME

Until you and your neighbors are obviously life-minded, how can you expect your enemies to stop plotting oligodynamic warfare against you, who are already so careless of the lives of millions — despite what you say. The first step in the education of foreigners is the education of yourself. When you learn the first duty of man toward his fellows and begin to perform it, then by word and more effectively by example you can become a teacher. Then you might enforce the pattern of biocratic education in the areas controlled by your armies of occupation—if they are not killed off by oligodynamic warfare loosed by defeated Japanese. You could try to teach the simple philosophy of scientific life against death.

Are there any words that would affect warped, stubborn, murderous personalities — especially those aware of your own murder-by-omission? Probably not. But visual sensations induce emotional transformations. In a small community here and a large one there, you could enforce and then promote a total effort for life—that is, you could estab-

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lish a bion, or biocratic unit or community.

First to be considered would be the most vital problems of actual want and spreading epidemics. Every life saved from suffering, every life made vigorous, would become a more effective teacher than you with your words, or your most brilliant exported educator. A peasant or a stubborn genius must *see* and otherwise *sense* before he is impelled to hazard a change in prejudice. When the greatest possible number have received the maximum possible re-invigoration, when the bion is moving as a unit up the road to life—sentient, very human life, when local research has been started on the problems affecting the bion as a whole, when an amazing hall of life has attracted the emotions and intellects of the men and women of the bion, then the flames of hopeful life will become merged into the fire of a novel ambition—for communal, national, and international progress up to the loftiest possibilities of human life. Only by kindling such fire can you educate. But only when you have tested and perfected biocracy at home can you begin to guide other peoples toward the road to life. Education must be by exciting example and by practical demonstration of the local values of biocracy. When you show that you have learned the first lesson to which conscious minds have been exposed through the ages, then you can hope to make biocracy international. When you show by thrilling action your understanding of the menaces of natural and unnatural oligodynamic warfare, then you will discover that you no longer need worry about oligodynamic weapons. You could not force even Japanese to run amok with secret weapons

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if these fellow men are healthy and comfortable in a biocratic society, the only *practically* hopeful kind.

Until there is a biocratic internationalism, remember that you are to blame for millions of preventable deaths. Are you not a voter in a democracy? Let these deaths be on your conscience, and the very thought of millions of needless deaths may cause you to bestir yourself.

“ . . . *Death!*

Hell shuddered at the hideous name, and sighed

From all her caves, and back resounded *Death!*”

A biocracy is you against death, generally murder or suicide by omission.

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